

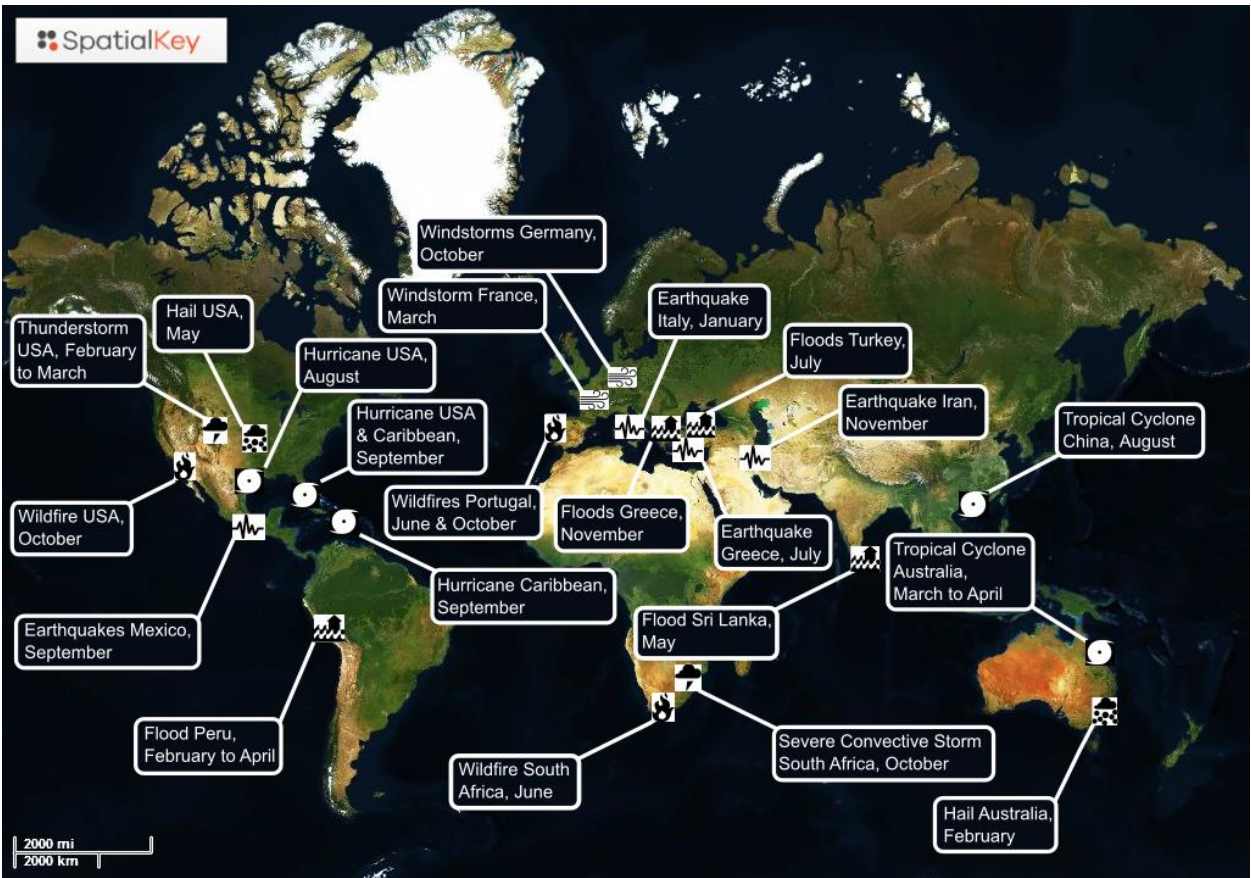
## **Willis Re Summary of Natural Cat Events 2017**

eVENT™ Natural Catastrophe Update  
Insured Losses and Economic Impact due to  
Natural Disasters

Volume 6 Issue 1

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Major natural catastrophes in 2017 per region based on insured losses (map source: Willis Re SpatialKey application)

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January 2018



# Major natural catastrophes in 2017

**This report summarizes economic and insured losses from the most relevant natural catastrophe events that occurred during 2017. Loss values presented include those reported by Willis Re, catastrophe model vendors, reinsurance companies and third party organizations. Loss estimates are presented in USD for which rates of exchange at 1<sup>st</sup> January 2017 have been applied.**

The insured loss estimates from major **natural catastrophes in 2017 of about USD 143 billion** are the highest since the annual market losses of USD 120 billion observed in 2011. These estimates do not include man-made disasters. The 2017 year losses have reversed the trend in loss reductions as seen from 2011 through 2015/2016, where insured losses had gone from USD 120 billion to 23.0/40.0 billion respectively. The economic losses have been much higher than the insured losses which show low insurance penetration in the selected regions affected by the catastrophes. In terms of casualties, more than 10,000 were reported during the entire year making it a deadly year.

The focal point of the year in terms of natural disasters comes from Hurricanes Harvey, Irma and Maria (colloquially known in the market as HIM) which severely impacted the Caribbean and the U.S. with a combined loss of about USD 75 billion. In the **U.S.** the largest insured losses came from Hurricanes Harvey, Irma and Maria with about USD 16 billion, USD 18 billion and USD 22 billion respectively (these estimates for Irma and Maria include the U.S.A. Virgin Islands and Puerto Rico). **Europe** had its largest market losses from windstorm Zeus hitting mainly France with about USD 300 million of insured losses, windstorm Thomas/Doris affecting Belgium, Germany, Ireland, the Netherlands and the U.K. with total losses of about USD 260 million, and windstorm Herwart impacting Austria, Czech Republic, Germany and Hungary with about USD 260 million losses. In **Asia**, the largest event was tropical cyclone Debbie in Australia with losses greater than USD 1.1 billion. Finally, the event with largest impact in **Latin America** was the Mexico earthquake in September with loss estimates of approximately USD 2.0 billion.

The aforementioned events, along with others having lower insured losses, are described in detail in the first part of this report, and are listed in chronological order, while a summary of events is provided in the tables at the end of the document, organized by peril/region affected.

## WS Egon

January 12 to 13, 2017

### France, Germany

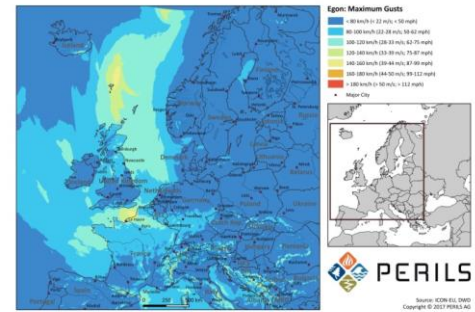


### Insured losses (in USD millions)

- 289 (PERILS)

### Fatalities: 3 (PERILS)

- Egon depression rapidly deepened during January 12 from 1005 hPa to 982 hPa in less than 12 hours, while situated over Brittany.
- Over the next 18 hours, Egon followed an easterly trajectory over northern Germany and Poland.
- Peak gust value in Dieppe, France was 147 km/h while 148 km/h peak gust was recorded in Weinbiet, Germany.
- High winds were followed by heavy precipitation including up to 0.3 m of snow in less than 12 hours in Germany.
- Three fatalities due to weather-related traffic incidents.
- In northern France, it was estimated that 330,000 households lost power and almost 4,500 storm related police and fire brigade call-outs were made.
- In Germany, Frankfurt airport cancelled 125 flights.
- The majority of damage was non-structural.



Low pressure system Egon as of  
January 12 (source: PERILS)

## EQ Central Italy

January 18, 2017

### Central Italy

### Magnitude 5.7

Max. Intensity:  
VIII – severe (MMI)



### Insured losses (in USD millions)

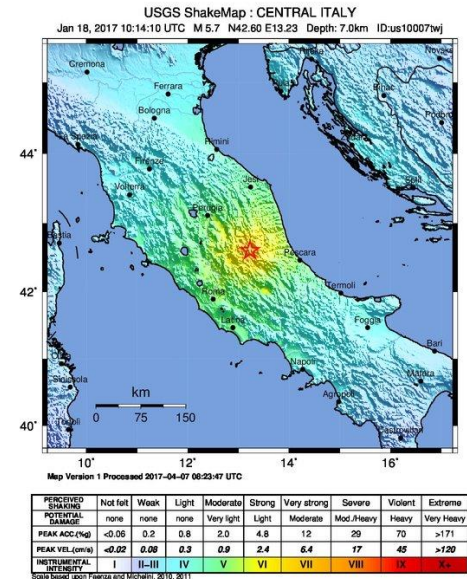
- < 210 (PERILS)

### Economic losses (in USD millions)

- 100-1,000 (with 35% probability, USGS)

Fatalities: > 30  
(including secondary hazards)

- On January 18, a series of four major earthquakes struck central Italy.
- The first earthquake struck near L'Alquila at 10:25 (local time) on January 18. Over the next 4 hours, a further three significant earthquakes occurred across central Italy, the largest of which originated approximately 6 km southwest of Amatrice with magnitude Mw 5.7.
- The earthquakes resulted from shallow normal faulting in a seismically active region within the Central Apennines mountain range. The area has been identified as a "seismic gap" between the August 2016 and October 2016 Italy earthquakes.
- MMI intensities of up to VIII (severe) were recorded in Amatrice and Monteneale (USGS).
- > 1 direct fatality. > 29 indirect fatalities after the earthquakes were believed to have triggered an avalanche which struck the Rigopiano Hotel in the Abruzzo region.
- Reports of structural damage were limited, although the region had previously been damaged significantly during the August 2016 earthquake.
- After shaking was felt in Rome, the metro system and numerous schools were closed as a precautionary measure.



Intensity (MMI) map of affected area following the strongest of the series of earthquakes (source: USGS)

## ST U.S.

January 18 to 23, 2017

### South and Southeast U.S.

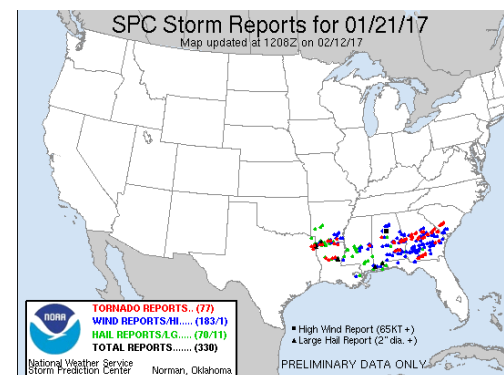


### Insured losses (in USD millions)

- 846.8-853.3 (PCS)

Fatalities: 19

- An outbreak of severe convective storms in the southern U.S. caused damage in parts of Mississippi, Georgia, Alabama, Louisiana, South Carolina, Texas and Florida.
- There were > 200 reports of severe weather across the southern U.S. and > 39 individual tornadoes reported due to an area of moist air originating in the Gulf of Mexico.
- 19 fatalities.
- > 1,500 homes are thought to have been damaged, with Mississippi, Georgia and Alabama being the worst affected states.
- > 1,220 homes were damaged or destroyed in the Hattiesburg area, Mississippi.



Thunderstorm report on January 21 (source: SPC, NOAA)

## FL Peru

February to April, 2017

### Peru



### Insured Losses (in USD millions)

- 380 (Munich Re)

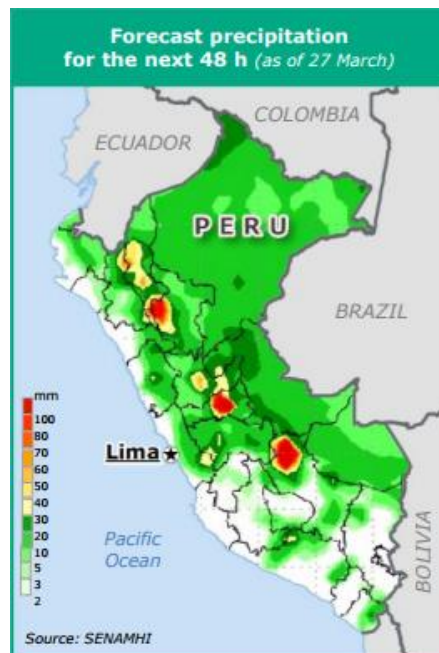
### Economic Losses (in USD millions)

- 3,100 (Munich Re)

### Fatalities:

- 114 (INDECI)

- Flooding in Peru between February and April was responsible for the costliest economic loss in the first half of 2017.
- The coastal El Niño phenomenon brought torrential rainfall to Peru, triggering the worst floods, landslides and mudslides in almost 30 years.
- During the three months, 47 localities were declared in emergency due to imminent risk of flooding.
- 114 fatalities, > 327 injured.
- > 1.6 million people were affected.
- According to INDECI, > 153,000 homes were damaged or deemed uninhabitable.
- > 6,475 km of roads were also reported to have been damaged or destroyed, with 514 bridges being damaged or washed away.
- > 37,000 hectares of crops were affected, contributing to agricultural losses.
- As of March 24, the Peruvian Red Cross (IFRC) reported > 349,000 cases of Acute Respiratory Infection, > 223,000 cases of Acute Diarrhoeal Diseases, > 5,200 cases of Dengue and > 1,000 cases of Zika as a result of water-transmitted diseases.



Forecast precipitation in Peru on March 27 (source: SENAMHI)

## HL Sydney

February 18, 2017

### Sydney, Australia

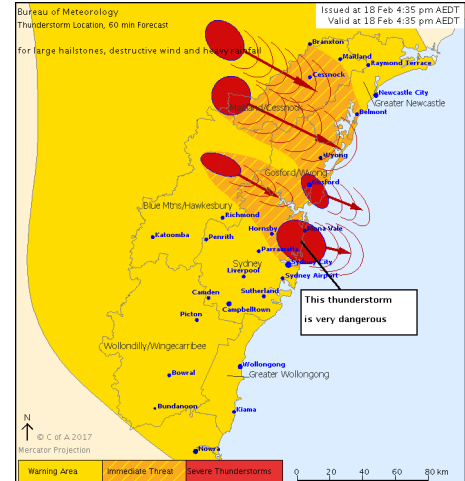


### Insured losses (in USD millions)

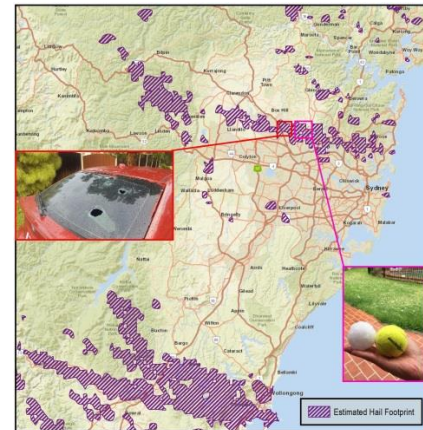
- 368.8 (ICA)

### Fatalities: 1

- Strongest storm activity in Sydney in the summer of 2016/17.
- Severe thunderstorms struck Sydney and parts of North South Wales, Australia on February 18, bringing damaging hail, lightning strikes, strong winds and rainfall.
- Hailstones of up to 8 cm in diameter and wind gusts of >100 km/h were reported.
- One fatality due to a car accident resulting from the severe weather.
- Four people were taken to hospital after being struck by lightning.
- The ICA received >19, 500 claims as of February 22, the majority of from the Hills district, northwest Sydney for damaged cars and homes, as well as hail damage to windows and roofs.
- In some of the worst affected areas close to Kellyville and Castel Hill, up to 80% of roof tiles were cracked, steel sheet roofing was damaged and exposed vehicles had panels severely dented and windshields destroyed.
- The NSW SES received > 650 calls for help on February 18.
- 40,000 homes remained without power throughout February 18 (Ausgrid).
- Multiple delays to flights in and out of Sydney airport.



**Thunderstorm locations on February 18 at 16:35 (local time) (source: Australian Bureau of Meteorology)**



**Radar derived hail footprint, February 18 (image sources: ABC, Daily Telegraph)**



**WS Thomas (Doris)****February 23 to 24, 2017****Belgium, Germany,  
Ireland, Netherlands,  
United Kingdom****Insured losses  
(in USD millions)****Total:**

- 262 (PERILS)

**Belgium:**

- 32

**Germany:**

- 81

**Ireland:**

- 1

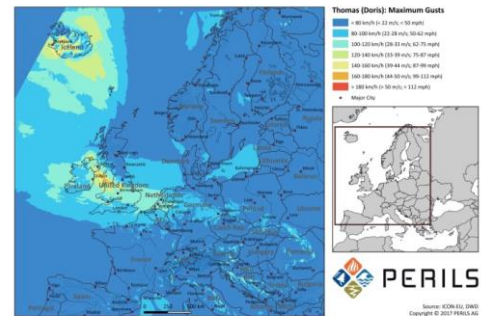
**Netherlands:**

- 25

**United Kingdom:**

- 118

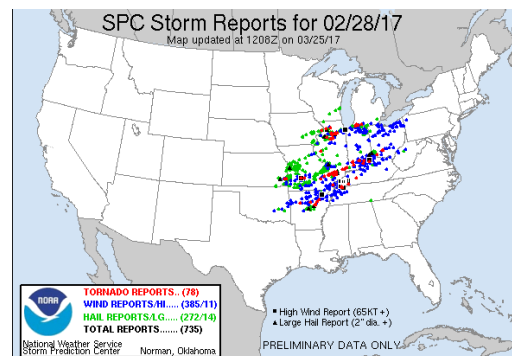
- The low pressure system underwent explosive cyclogenesis on the morning of February 23, dropping pressure from 1005 hPa to 980 hPa.
- The cold front associated with Thomas brought heavy rain with some snowfall.
- Peak gusts reached 152 km/h in Capel Cruig, Wales with widespread gusts above 100 km/h across to northern Germany.
- Five fatalities, three in United Kingdom and two in Belgium.
- Significant damage seen in Ireland, United Kingdom, Belgium, Netherlands and Germany, with minor impacts felt in neighboring regions. However, the majority of damage was non-structural.
- Disruption included power cuts to 500,000 households in the United Kingdom.

**Low pressure system Thomas (Doris) as of February 23 (source: PERILS)****Fatalities: 5 (PERILS)****TO U.S.****February 28 to March 2, 2017****Midwest U.S.****Insured losses  
(in USD millions)**

- 901-1,370.2 (PCS)

**Fatalities: 19**

- Tornadoes, hail, and powerful winds caused widespread damage in the Midwest and parts of Northeast and Southeast United States.
- At least 16 tornadoes ranging from EF-0 to EF-3 and 16 reports of hail larger than 50 mm were confirmed by the National Weather Service.
- 19 fatalities.
- Tornadoes so far north in winter is unusual but the combination of warmer than average surface temperature and moisture from the Gulf of Mexico encouraged the severe convection.

**Thunderstorm report on February 28 (source: SPC, NOAA)**

## WF Southern Plains

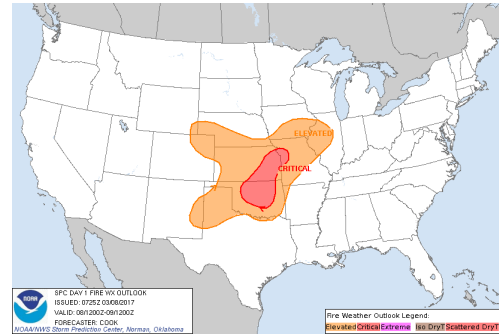
March 5 to 7, 2017

**Kenwood Avenue,  
San Luis Obispo  
County, Lake County**



**Fatalities: > 7**

- Several large wildfires together burned > 1 million acres (404,686 hectares) of land across the southern U.S. plains, covering the Texas panhandle, Kansas, Oklahoma, and Colorado.
- All of the wildfires were triggered and spread rapidly due to dry surface fuel, strong winds, high temperatures and low humidity.
- > 7 fatalities.
- Thousands of people were evacuated in Kansas and Oklahoma.
- > 60 buildings, bridges, homes, barns, hog production complexes, and vehicles were reported as damaged or destroyed.
- It was estimated that thousands of cattle were also killed, contributing to agricultural losses.



**Fire weather outlook for March 8 (source: NOAA)**

## WS Zeus

March 6 to 7, 2017

**France**



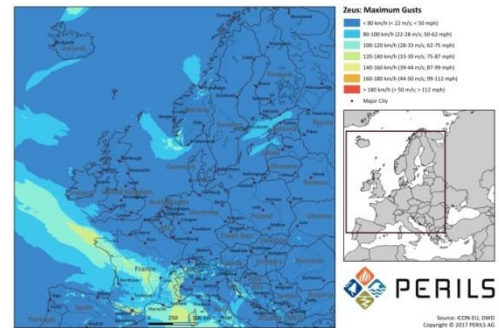
**Insured losses  
(in USD millions)**

**France:**

- 299 (PERILS)**

**Fatalities: 2 (PERILS)**

- System underwent explosive cyclogenesis in the early hours of March 6.
- Gusts peaked at 193 km/h in Camaret-sur-Mer in Brittany, with strong winds in a corridor running NW-SE across France to Nice.
- Two fatalities in France.
- Majority of damage was non-structural.
- With over 600,000 households affected in power cuts in France, it was the most affected in the nation since December 1999.
- Minor impact in Switzerland and on island of Corsica, including flights cancelled.



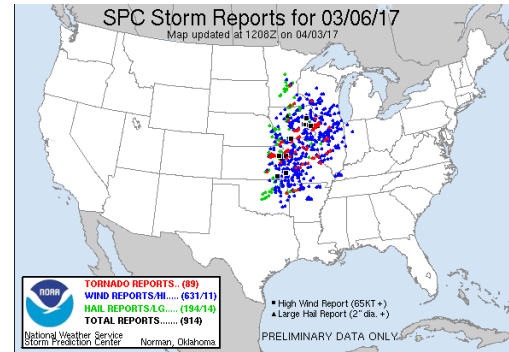
**Low pressure system Zeus as of March 6 (source: PERILS)**

**TO Midwest U.S.****March 6 to 9, 2017****Midwest U.S.****Insured losses  
(in USD millions)**

- 1,100-1,599.8 (PCS)

**Fatalities: 0**

- An outbreak of tornadoes with additional straight line winds tore across Missouri, Iowa, and Minnesota, with minor damage reported in Kansas, Arkansas, Illinois, Indiana, Kentucky, Nebraska, Oklahoma and Wisconsin.
- Warm moist air ahead of a surface low over the eastern Dakotas generated the unstable conditions conducive for the formation of tornadoes.
- 15 people injured.
- 700 properties were reported to have been destroyed or damaged.
- An EF-3 tornado tracked for 12 miles through western Missouri and damaged or destroyed around 500 homes and 12 commercial buildings. Several EF-2 and EF-1 tornados also caused significant damage.
- The event occurred less than a week after at least 16 tornadoes impacted over 500 counties across the Midwest, damaging several hundred buildings.

**Thunderstorm report on March 6 (source: SPC, NOAA)****HL U.S.****March 26 to 28, 2017****South and  
Southeast U.S.****Insured losses  
(in USD millions)**

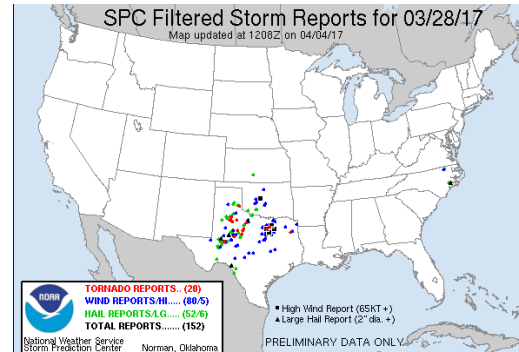
- 1,298-1,967.3 (PCS)

**Economic losses**

- 2,700 (NOAA)

**Fatalities: 0**

- Thunderstorms developed on March 26, bringing large hail, high wind and tornadoes to Mississippi, Alabama, Tennessee, Texas and Kentucky.
- Hail as large as 108 mm was reported in the Dallas-Ft. Worth metro area.
- Elsewhere, hail up 76 mm ravaged areas throughout Alabama, Oklahoma and Tennessee causing significant damage to roofs, sidings and vehicles.

**Thunderstorm report on March 28 (source: SPC, NOAA)**

## TC Debbie

March 28 to April 03, 2017

Queensland,  
Australia

Category 4



Insured losses  
(in USD millions)

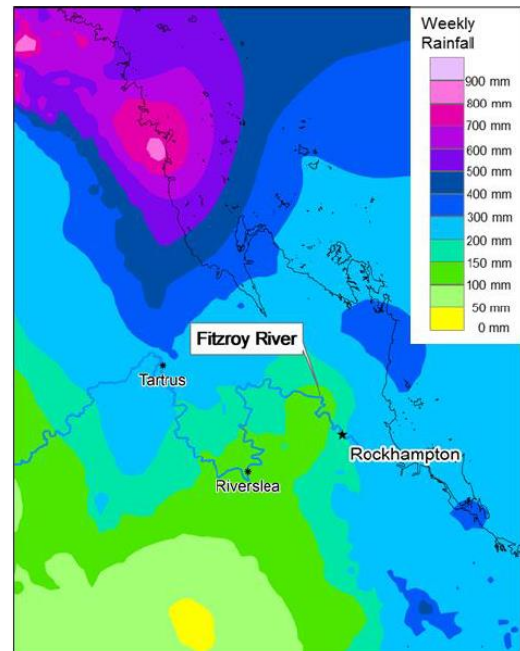
- 1,320 (Swiss Re)
- 1,400 (Munich Re)
- 1,194 (PERILS)
- 1,161 (ICA)

Economic losses  
(in USD millions)

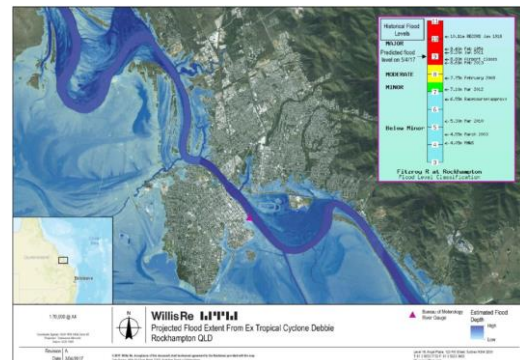
- 2,510 (Swiss Re)
- 2,700 (Munich Re)

Fatalities: 12

- Extensive flooding and strong winds rank Cyclone Debbie as the second-most expensive cyclone in Australian history.
- The first signs of a tropical low occurred on March 22 over the north Coral Sea. This low developed into Category 1 TC Debbie on March 25.
- Due to increasingly favorable conditions, TC Debbie rapidly intensified from Category 2 to Category 4 strength within 12 hours on the March 27. TC Debbie continued moving southwest at a speed of about 9 km/h.
- On March 28, TC Debbie's eye crossed Airlie Beach 50 km southeast of Bowen as a Category 4 cyclone with wind speeds of up to 190 km/h (gusts up to 260 km/h).
- Upon landfall, TC Debbie slowed to 7 km/h, exposing towns in the affected region to strong winds and heavy rains for many hours.
- TC Debbie weakened to a tropical low at around 03:00 (local time) on March 29. As the remains tracked across southeast Queensland and northern NSW, it interacted with a cold front crossing SE Australia. The combination of tropical moisture, instability and strong onshore winds resulted in exceptionally heavy rainfall in coastal catchments between Gladstone and Coffs Harbor, particularly south of Brisbane.
- The greater Mackay area experienced 986 mm in a 24 hour period. The northern part of the Fitzroy River catchment reached saturation and rainfall totals across nearly the entire Fitzroy basin exceeded 50 mm.
- A 2.6 m storm surge was recorded by the Laguna Quays storm tide gauge (JCU).
- 12 fatalities.
- > 20,000 people were forced to evacuate and > 400 people were rescued.
- Insured losses from TC Debbie resulted primarily from flood related damage.
- Numerous reports of property inundation and infrastructure damage. Significant structural damage was also experienced in the Whitsunday Islands.
- Local cane growers incurred AUD 150m worth of damage, while Australia's largest winter cropping region reported losses of approximately AUD 100m.
- Over 700 powerlines were felled, causing > 63,000 homes to be without power.



7-day rainfall totals in the Fitzroy River catchment for the week ending April 1 (source: Australian Bureau of Meteorology)



Estimated flood extent in Rockhampton derived from LiDAR data

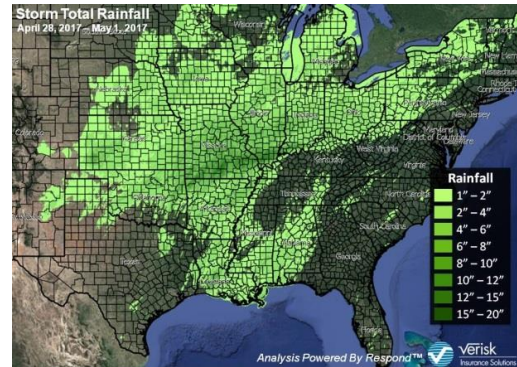


**FL U.S.****April 28 to May 1, 2017****South and Midwest U.S.****Insured losses  
(in USD millions)**

- 540-606 (PCS)

**Fatalities: 9**

- Persistent heavy rain led to widespread flash and river flooding across the South and Midwest between April 28 and May 1.
- Accumulated rainfall exceeded 200 mm across large parts of the U.S.
- Several river gauges broke long-standing water level records, including 14 locations along the tributaries of the Mississippi River, of which 12 were recorded in Missouri.
- A round of severe storms that included tornadoes swept through several small towns in east Texas, leaving behind a trail of destruction.
- A second weather system passed over the flooded area on May 3-4, producing localized rainfall totals of 25mm to 100 mm.
- Nine fatalities.
- Flooding damaged or destroyed more than 700 buildings across at least six states.



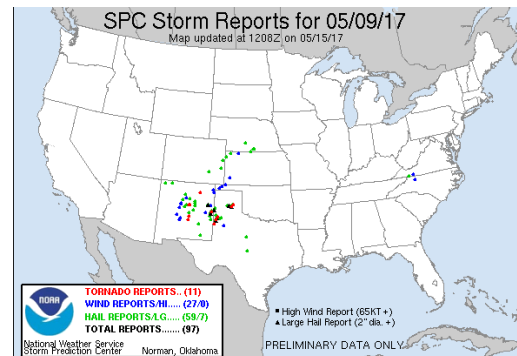
**The distribution of rainfall from April 28 through May 1, 2017 over the Midwest and southern U.S. Dark green indicates highest rainfall amounts (source: PCS via Google Earth)**

**HL Midwest U.S.****May 8 to 11, 2017****Southern Midwest U.S.****Insured losses  
(in USD millions)**

- 1,755-2,507.4 (PCS)

**Fatalities: 0**

- A severe convective storm passed over Denver, Colorado on May 8 and continued east, producing high winds, large hail, and several tornadoes.
- Hail up to 70 mm was reported in Wheat Ridge, Colorado as well as street flooding in the Denver metro area.
- Hailstones caused damaged to over 1,000 vehicles, as well as roof, siding, windows, and skylight damage to buildings.
- Due to the slow movement of the storm, accumulation of hail caused traffic delays and clogged drains leading to flooding.



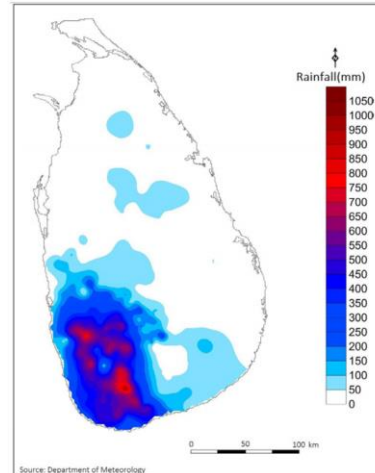
**Thunderstorm report on May 9 (source: SPC, NOAA)**

**Sri Lanka****Economic losses  
(in USD millions)**

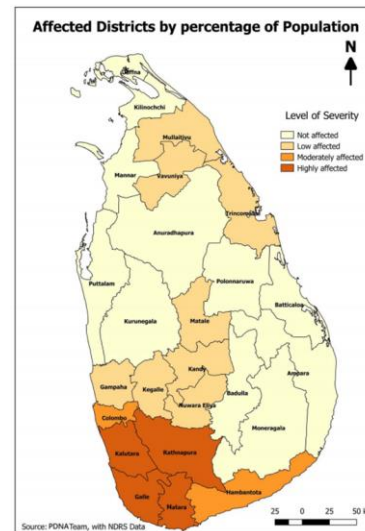
- **473** (Post-Disaster Needs Assessment )

**Fatalities: 219**

- Worst monsoon rains to hit Sri Lanka since 2003.
- 15 of 25 districts in Sri Lanka were affected by strong winds and persistent rainfall, triggering floods and landslides.
- The floods resulted from a heavy Southwest Monsoon which began on May 18. An area of low pressure over the southwest Bay of Bengal (later to become TC Mora) further intensified rainfall during the final week of May.
- Galle, Ratnapura, Matara, Kalutara and Hambantota were the most severely impacted districts
- In Millakanda, Kalutara 615.1 mm of rain was recorded over a 24-hour period on May 26 (RMS). In some areas the water levels reached 6 m high and remained for 4-10 days.
- A total of 879,778 people were affected (DMC) with 213 deaths, 154 injured and 96 missing.
- 109,890 people were evacuated from the flooded areas.
- 35 major landslides caused the majority of deaths (176 out of 219).
- 3,048 houses were destroyed and a further 76,803 damaged in floods, landslides and high winds (NDRSC).
- Significant damage (> 69 million USD) to agriculture, livestock and fisheries was reported in the worst impacted districts. Sri Lanka is the world's second largest tea exporter and agriculture makes up about 12% of the country's GDP (PDNA). The MDM identified approximately 70,000 flood victims that were severely food insecure and needed food assistance.
- The total long term recovery needs are estimated to be USD 794.9 million (PDNA).



**Cumulative rainfall between May 24-30  
(source: Department of Meteorology)**



**Affected districts (source: PDNA)**

**WF South Africa****June 6, 2017****Knysna, Western Cape, South Africa****Insured losses  
(in USD millions)**

- **146-182** (Willis Re at June 2017)

**Fatalities: 10**

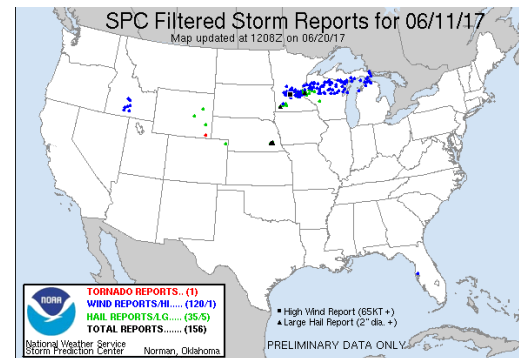
- On June 6, a destructive wildfire broke out in Knysna in the Western Cape Province, aggravated by high winds resulting from a severe winter storm.
- The fire was fueled by sustained high winds of 60-80 km/h and preceding drought conditions, during which water stocks had been depleted to < 10% of capacity.
- Ten fatalities.
- More than 10,000 people were displaced in Knysna due to the wildfire.
- A further 2,000 people were displaced in Western Cape due to flooding, as 63 mm of rain occurred in 24 hours.
- Roads were closed and train services affected. Flight disruption was limited.
- The fire covered an extent stretching ~ 50 km, affecting numerous residential and commercial properties along the Garden Route.
- While the two phenomena occurred as a result of the same weather disturbance (South African Service), the losses due to fire far outweighed storm losses.

**Wildfire footprint at 13:41, June 8 (source: Global Kinetic Wildfire via SpatialKey)****HL Midwest U.S.****June 11, 2017****Upper Midwest U.S.****Insured losses  
(in USD millions)**

- **980-1,548.6** (PCS)

**Fatalities: 0**

- A fast-moving line of storms developed and pushed through the Upper Midwest, bringing heavy rains, hail and strong winds on June 11.
- Hail up to 51 mm and wind gusts up to 85 mph (137 km/h) were reported near Minneapolis, Minnesota as well as street flooding with rainwater.
- 132,000 household lost power throughout the Twin Cities metro and St. Cloud areas in Minnesota.
- There were reports of significant damage to roofs and siding on residential and commercial buildings throughout both Minnesota and Wisconsin.
- This storm was closely followed by another round of severe convective storms sweeping across the Midwest, bringing wind, hail, and tornadoes to the region only a few days later.

**Thunderstorm report on June 11 (source: SPC, NOAA)**

## EQ Lesbos

June 12, 2017

Lesbos, Greece

Magnitude 6.3

Max. Intensity:  
IX – violent (MMI)



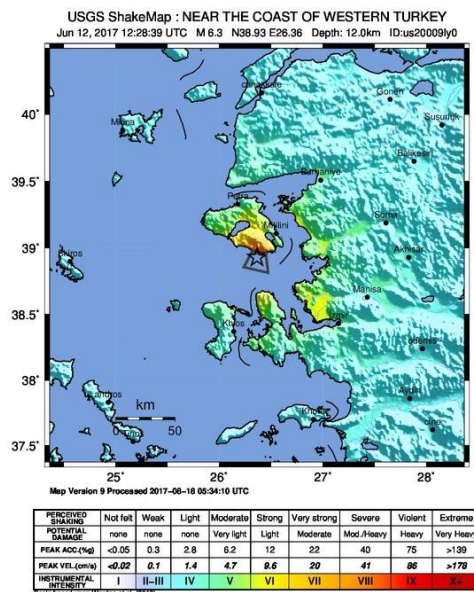
Insured losses  
(in USD millions)

- 1.1-5.3 (Willis Re at June 2017)

Economic losses  
(in USD millions)

- 10-100 (with 33% probability, USGS)

- On June 12 at 15:28 (local time), a magnitude Mw 6.3 earthquake struck the eastern Greek islands and the western coast of Turkey.
- The epicenter was located 4 km south of Plomari, Lesbos.
- MMI values of up to IX (violent) in Plomari and V (moderate) in Izmir, Turkey were reported (USGS).
- The event occurred in an active seismological area characterized by numerous faults which have hosted Mw 6.5+ events in the past.
- One fatality and 15 injured in Lesbos.
- 500 people were reported to have been displaced.
- Extensive damage was reported in the Greek village of Vrisa and in other villages along the southern coast of Lesbos, where many buildings were severely damaged. Elsewhere in Lesbos, building facades suffered damage.
- The earthquake was thought to have the potential to trigger other damaging earthquakes up to magnitude M6.5+.



Intensity (MMI) map of affected area (source: USGS)

Fatalities: 1

## WF Portugal

June 17 to 19, 2017

Central Portugal

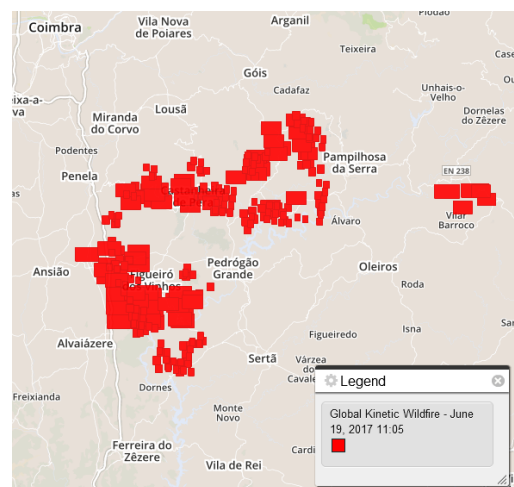


Economic losses  
(in USD millions)

- 523 (Portuguese Government via ECO News)

Fatalities: > 64

- On June 17, a series of wildfires erupted across central Portugal. The wildfires, which continued for several days, were the deadliest in the country's history.
- The fires originated in the mountainous region of Pedrógão Grande, about 200 km north-northeast of Lisbon. A total of 156 fires subsequently erupted across the country.
- Dry vegetation, resulting from a precursory heat wave with temperatures in excess of 40°C, combined with intense dry storms likely caused the fires.
- 64 fatalities, > 200 injured.
- Most casualties were recorded in Pedrógão Grande where a fire swept across a road occupied by evacuees.
- 481 houses were reported to have suffered fire damage, with the Portuguese Government funding the rebuilding of 170 homes (Portuguese Government via ECO News).



Wildfire footprint at 11:05, June 19 (source: Global Kinetic Wildfire via SpatialKey)

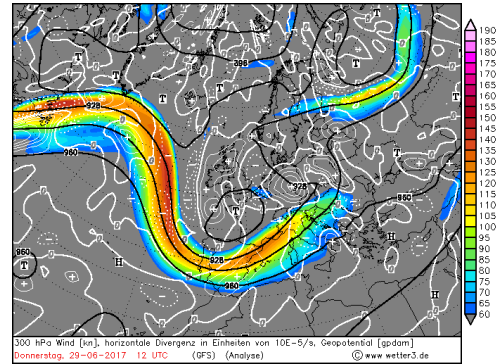


**ST Series****June 22, 2017****Germany****Insured losses  
(in USD millions)**

- 315 (Willis Re – Property Loss)

**Fatalities:**  
**Unknown**

- Severe Thunderstorm series including Paul and Rasmund.
- Losses were caused by hail, Flood and Wind.
- Low pressure system Rasmund, with a minimum pressure below 990 hPa, led to the formation of Hailstorm Paul.
- Consisted of a number of smaller hailstorms, affecting areas from Ruhr to Göttingen.



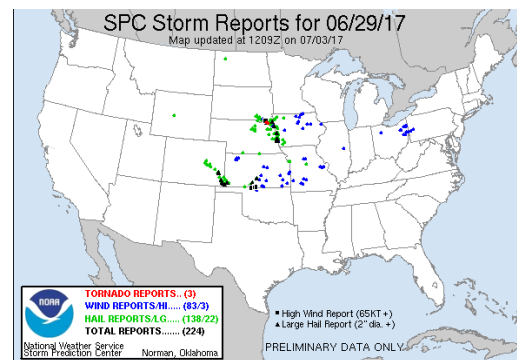
**Low pressure system Rasmund, associated to Hailstorm Paul as of June 22 (source: Wetter3)**

**HL Midwest U.S.****June 27 to 29, 2017****Midwest U.S.****Insured losses  
(in USD millions)**

- 767.8-1,114.2 (PCS)

**Fatalities: 0**

- Severe thunderstorms developed and progressed through the Central Plains and Upper Midwest region, producing large hail, high winds, and tornadoes.
- Hail up to 108 mm was reported in Sergeant Bluff, Iowa along with wind gusts up to 70 mph (113 km/h) across Dubuque and South Sioux City in Iowa and Nebraska respectively.
- There were reports of significant damage to roofs and siding on residential and commercial buildings throughout Iowa, Illinois and Nebraska as well as broken windshields, mirrors and body damage to vehicles.



**Thunderstorm report on June 29 (source: SPC, NOAA)**

## FL Turkey

July 18, 2017

### Northwest Turkey

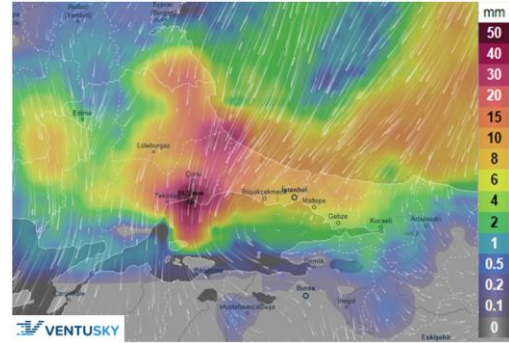


### Insured losses (in USD millions)

- 45 (PCS)
- 33 (Insurance Association of Turkey via Asia Insurance Review)
- < 142 (PERILS)

### Fatalities: 0

- Heavy rainfall on July 18 caused flash flooding across northwest Turkey, with significant disruptions to transport links in Istanbul.
- In some areas of Istanbul, severe thunderstorms brought up to 53 mm of rain in a few hours.
- Flooding was exacerbated by impervious surfaces and buildings located close to rivers and flood plains.
- Commuters were forced to abandon their submerged vehicles on a number of roads. The Eurasia road tunnel was closed for several hours.
- The tram services between Bağcılar and Kabataş were also suspended along with the metro service connecting the city and Ataturk International Airport.
- As of August, 7,000 claims due to the flash floods had been received by the Insurance Association of Turkey, with a total value of TRY 116 million (USD 33 million) (Insurance Association of Turkey via Asia Insurance Review).



**Accumulated precipitation in Istanbul  
between 09:00-12:00 on July 18 (source:  
Ventusky)**

**EQ Kos-Bodrum****July 21, 2017****Kos, Greece  
Bodrum, Turkey****Magnitude 6.6****Max. Intensity:  
VII – very strong  
(MMI)****Insured losses  
(in USD millions)**

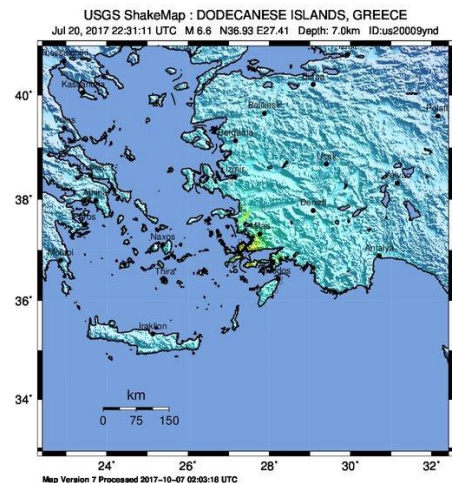
- **4.2-8.4** (Willis Re at July 2017)

**Economic losses  
(in USD millions)**

- **1-10** (with 34% probability, USGS)

**Fatalities: 2**

- On July 21 at 01:31 (local time), a magnitude Mw 6.6 earthquake struck the eastern Greek islands and the western coast of Turkey.
- The epicenter was located in the Aegean Sea 10km south east of Bodrum, Turkey and 15km north east of the island of Kos.
- MMI shaking intensities of VII (very strong) and VI (strong) were recorded in Kos (population ~19,000) and Bodrum (population ~39,000), respectively (USGS).
- The earthquake occurred on an east-west trending normal fault within a seismologically active area; several Mw 6.5+ events have been recorded in the last three centuries (GEM).
- The earthquake is believed to have originated on a small segment of the Gokova fault, which extends 100 km inland towards the southwestern coast of Turkey and is capable of producing a magnitude ~7.3 earthquake (Tembloir).
- A small tsunami (~0.4 m wave height) was generated, causing localized flooding in the coastal town of Gümbet, Turkey, where inundation reached up to 60 m inland.
- Two fatalities and > 120 injured in Kos. > 360 injured in Turkey.
- Extensive damage was experienced in the main town in Kos where many older buildings were severely damaged.
- The commercial port of Kos reported major damages and was not operational for a period. Damage in Bodrum was much less significant.
- As of July, 141 buildings in Kos were deemed uninhabitable due to earthquake damage (Natural Disasters Rehabilitation Directorate).
- As of August, the Insurance Association of Turkey had received 800 claims with combined value of TRY 12 million (USD 3.4 million) (Insurance Association of Turkey via Asia Insurance Review).
- Interaction with the June 12 Lesbos earthquake is thought to have been limited, given that the events were separated by ~230 km and the Lesbos earthquake fault dimension was ~20 km.



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./heavy	Heavy	Very Heavy
PEAK ACC.(%)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	<0.02	0.1	1.4	4.7	9.6	20	41	86	>178
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

**Intensity (MMI) map of affected area (source: USGS)**

## HL Turkey

July 27, 2017

### Istanbul, Turkey

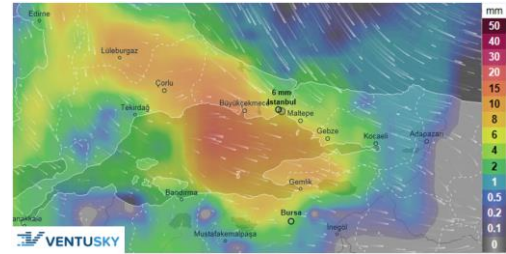


#### Insured losses (in USD millions)

- 253 (PCS)
- 48 (Insurance Association of Turkey via Asia Insurance Review)
- < 142 (PERILS)

#### Fatalities: 0

- On July 27, a supercell thunderstorm hit Istanbul, resulting in an intense hailstorm and flash-flooding.
- The storm occurred around 18:00 local-time, lasting approximately 20 minutes.
- Hailstones of up to 9 cm in diameter were observed and heavy rain caused localized flash-flooding, which was intensified by poor drainage and impermeable surfaces.
- The Istanbul Metropolitan Municipality reported 90 roofs destroyed during the storm, including the collapse of a minaret in the Küçüçekmece district.
- Hundreds of vehicles in rush-hour traffic were damaged by hail.
- Many vehicles were also abandoned due to flash-flooding in Beşiktaş and the Eurasia Tunnel was closed temporarily.
- Four planes reported hail damage and sixteen planes were diverted from Atatürk airport.
- As of August, the **Insurance Association of Turkey** reported 22,000 claims resulting from flood and hail damage amounting to TRY 168 million (USD 48 million) (Insurance Association of Turkey via Asia Insurance Review).



**Accumulated precipitation in Istanbul between 16:00-19:00 on July 27 (source: Ventusky)**



## TC Hato

August 23 to August 28, 2017

China, Vietnam

Max. Category 3



Insured losses  
(in USD millions)

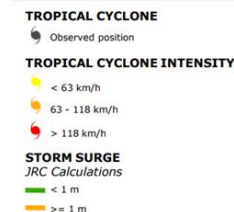
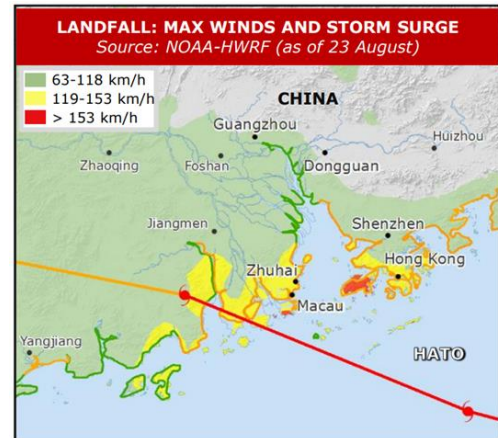
- 129-224 (AIR)

Economic losses  
(in USD millions)

- < 1, 440  
(Chinese  
Ministry of Civil  
Affairs)

Fatalities: 22

- Hato formed as a tropical depression on Aug 20 about 740 km southeast of Wake Island in the western Pacific
- After tracking offshore 55 km south of Hong Kong, TC Hato made landfall 35 km southwest of Macau at 14:00 (local time) on Aug 23.
- After making landfall over the coast of Zhuhai, Hato entered western Guangdong and gradually weakened into an area of low pressure over Yunnan. Hato dissipated on Aug 24.
- Hato caused a severe storm surge along the coast of Pearl River estuary. Record-high sea levels were recorded in many places.
- One report of landslide and a number of flooding reports were received.
- A storm surge of 2.79 m and a maximum sea level of 6.14 m were recorded at Zhuhai.
- 22 fatalities, >250 injured
- 27,000 were evacuated in Guangdong province, China. In total, 740,000 people were affected.
- 6,500 houses collapsed.
- Many residential and commercial areas in Macau had limited access to water and electricity.
- Transportation services in Hong Kong were seriously affected. > 480 flights were cancelled at the Hong Kong International Airport.
- Many roads were closed due to strong winds, fallen trees and flooding.



Maximum winds and storm surge as of August 23 (source: NOAA)

## HU Harvey

August 25 to September 1, 2017

**Yucatan Peninsula, Mexico, Texas, Louisiana, Alabama, Mississippi, North Carolina, Tennessee**

**Max. Category 4  
Category 4,1 at landfall**



**Insured losses  
(in USD billions)**

- 25-35 (RMS, incl. loss to NFIP)
- 10+ (AIR)
- 15.4 (KCC)
- 15.7 - 15.93 (PCS)

**Economic losses  
(in USD billions)**

- 108 (Moody's Analytics)
- 85 (Goldman Sachs)

**Fatalities:  
88**

- Major Hurricane Harvey caused catastrophic and unprecedented inland flooding across southeast Texas and southern Louisiana.
- Harvey formed as a tropical storm on August 17 on the east side of the Windward Islands. It struggled to intensify under hostile conditions and degenerated into a tropical wave on the August 19.
- Harvey regenerated and reached category 4 hurricane strength on August 25 just before landfall north of Port Aransas, Texas.
- Hurricane Harvey made U.S. landfall between Port Aransas and Port O'Connor, Texas around 03:00 (UTC) as a category 4 storm (SSHWS) with maximum sustained winds of 130 mph (209 km/h).
- Harvey tracked slowly inland and stalled over Texas Hill County for around 24 hours.
- The system then drifted southeast back towards the Texas coastline, entering the Gulf of Mexico at around 15:00 (UTC) on August 28.
- During the long period over land, intense and prolonged rainfall was centered on southeast Texas and over the Houston metro area in particular.
- After reemerging over the Gulf, Harvey moved northeast along the Texas coast and made another landfall just west of Cameron, LA early August 30.
- The Houston-Galveston and upper Texas areas experienced over 1270 mm of rain causing catastrophic and life-threatening flooding reaching up to 3.7 m.
- A tidal gauge in Port Lavaca, TX reported storm surge of 6.4 feet.
- 88 fatalities in U.S.
- Approximately 13 million people were under flood watches and warnings stretching from Corpus Christi to New Orleans.
- Over 780,000 Texas citizens experienced mandatory evacuation. 6,800 people faced mandatory evacuation in Louisiana.
- 200,000 homes suffered flood damage, with around 12,600 destroyed along with up to one million cars incurring flood damage.



**Wind speed and path of Hurricane Harvey  
(source: NOAA via ESRI)**



**Hurricane Harvey path as of August 25  
(source: NOAA)**

## HU Irma

September 6 to 12, 2017

**Lesser Antilles, British Virgin Islands, U.S. Virgin Islands, Puerto Rico, Haiti, Dominican Republic, The Bahamas, Cuba, Alabama, Florida, Georgia, North Carolina, South Carolina**

**Max. Category 5  
Category 5,4,3,2 at  
landfall**



### Insured losses (in USD billions)

- 25-35 (RMS, US incl. loss to NFIP)
- 10-20 (RMS, Caribbean)
- 25-35 (AIR, US)
- 7-15 (AIR, Caribbean)
- 25 (KCC)
- 15.1-18 (PCS, US)

### Economic losses (in USD billions)

- 70.5 (Moody's Analytics)
- 30 (Goldman Sachs)

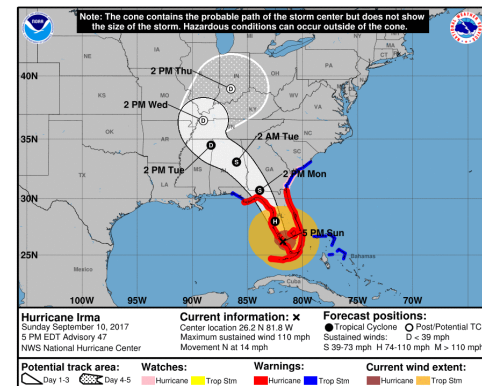
### Fatalities:

- 134 (US)
- 68 (Caribbean)

- Hurricane Irma was the second strongest storm that has ever existed in the Atlantic in terms of both maximum wind speed and Accumulated Cyclone Energy, after Hurricane Allen in 1980.
- Irma formed on August 30 in the eastern tropical Atlantic and quickly intensified into a hurricane just 24 hours later, continuing to strengthen to become a Category 5 storm on September 5.
- Irma remained a Category 5 Hurricane for 3 consecutive days, the longest in satellite history.
- Hurricane Irma heavily impacted locations in the northern Leeward Islands through September 5-6 with maximum 1-minute sustained winds of 185 mph.
- Barbuda was particularly badly affected, with CDEMA reporting 99% of building stock being damaged. Anguilla also sustained critical damage, with 90% of buildings damaged.
- Irma then moved through the Virgin Islands causing extensive damage, before passing by the north of Puerto Rico, the Dominican Republic and Haiti. Haiti was mostly spared widespread wind damage; except the far north which was severely affected; intense rainfall led to localized river flooding.
- After weakening to a Category 3 storm due to landfall in Cuba, hundreds of miles of coastline were inundated with flooding. Irma reintensified into a Category 4 while crossing over the Straits of Florida.
- Irma made landfall on September 10 in the lower Florida Keys as a low-end Category 4.
- The storm made a second landfall in Florida at Marco Island as a Category 3 and proceeded up the southwest coast of the state, bringing strong winds to central and northern Florida, as well as Alabama, Georgia and South Carolina.
- Irma resulted in flash flooding in Puerto Rico, Florida, Georgia and South Carolina.
- Storm surges between 6 to 12 feet along Florida coast.
- > 6.5 million people were evacuated from Florida, with additional thousands in other southeast states.
- Millions of people lost power throughout the Caribbean and U.S.
- Significant damage to roofs, sidings and windows in Florida due mainly to wind, surge, and flooding.



**Wind speed and path of Hurricane Irma**  
(source: NASA, NHC)



**Hurricane Irma path as on September 10, 2016**  
(source: NOAA)

## EQ Mexico

September 7, 2017

### Offshore Chiapas, Mexico

Magnitude 8.1

Max. Intensity:  
IX – Violent (MMI)



Insured losses  
(in USD millions)

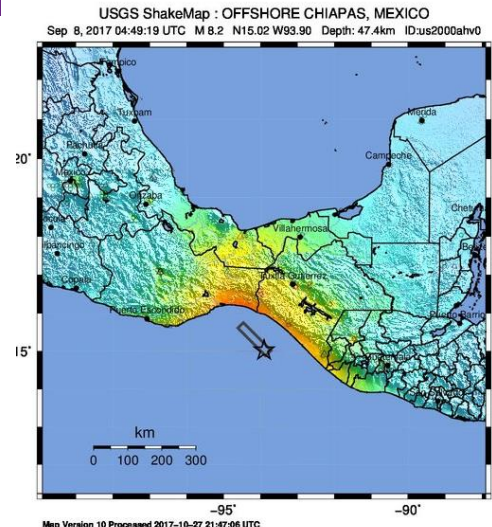
■ 792-1130 (AIR)

Economic losses  
(in USD millions)

■ 2,000  
(Insurance  
Journal)

Fatalities: 96  
(RMS)

- Strongest earthquake Mexico has experienced in 100 years.
- On September 7 at 23:49 (local time), a magnitude Mw 8.1 earthquake struck offshore from Chiapas, Mexico.
- The epicenter was located in the Pacific Ocean, 198 km SSW of Tuxtla Gutiérrez, Mexico and 356 km west of Guatemala City.
- The earthquake occurred as a result of normal faulting at around 70 km depth.
- MMI shaking intensities of up to XI (violent) were recorded, with 574,000 people experiencing shaking of VIII (severe) and > 28 million feeling shaking of V (moderate) or greater (USGS).
- 96 fatalities, > 200 injured.
- The earthquake triggered a tsunami warning with the evacuation of thousands of people in coastal communities in Chiapas. Maximum wave height of 1.75 m was reported by the Pacific Tsunami Warning Centre; however, no major damage was reported.
- Southern Mexico, particularly the state of Oaxaca, was the worst affected. The states of Chiapas and Tabasco were also heavily impacted.
- Federal officials reported that in Oaxaca, 11,000 homes were damaged or destroyed.
- Chiapas Civil Protection Agency reported that > 54,000 homes were damaged, about 37,000 of which experienced partial damage, and nearly 18,000 collapsed.



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC. (mg)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL. (cm/s)	<0.02	0.1	1.4	4.7	9.6	20	41	86	>178
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Intensity (MMI) map of affected area  
(source: USGS)



## HU Maria

September 16 to 30, 2017

North America  
Caribbean

Category 5



Insured Losses  
(in USD billions)

- 15-30 (RMS, Caribbean)
- 27-48 (AIR)
- 29.8 (KCC)
- 21.9-22.4 (PCS)

Economic Losses  
(in USD billions)

- 30-60 (RMS)
- 45-95 (Moody's Analytics)

Fatalities:

- 65-108 direct
- 1,085 indirect

- Maria was the deadliest hurricane of the 2017 Atlantic hurricane season.
- Hurricane Maria rapidly intensified from a Tropical Depression to a Category 5 Hurricane in 54 hours.
- Maria was a relatively small, but extremely intense, system. The highest wind speeds occurred in a 10 km radius around the eye, with maximum one-minute sustained winds of 175 mph recorded on September 20.
- Maria formed as a tropical storm on September 16 on the east side of the Lesser Antilles. Due to highly favorable environmental conditions the storm exploded in intensification as it approached the island arc.
- Maria made its first landfall over Dominica on September 19 as a Category 5 hurricane, with maximum 1-minute sustained winds of 159 mph at landfall.
- According to CDEMA, 100% of Dominica was impacted; 98% of buildings sustained roof damage and 50% of homes sustained structural damage, including the main hospital in Roseau.
- Maria made Landfall in Puerto Rico as a Category 4. In Catano, 80% of buildings were destroyed (RMS). Many hospitals and San Juan airport were severely damaged. Additionally, > 80% of the power distribution network was damaged causing power outages for 3 to 6 months (RMS).
- Extreme rainfall fell in central Puerto Rico, causing extreme flash flooding and widespread flood inundation.
- Other heavily impacted islands were Turks and Caicos, U.S. Virgin Islands (St Croix and St Thomas), Guadeloupe and Martinique, adding to the extensive damage caused by Hurricane Irma in September (RMS).
- 98 fatalities reported; media sources suggest the actual death toll could total up to 1,000.
- In the continental U.S. Maria brushed the Outer Banks of North Carolina and brought tropical storm conditions to the area along with storm surge and rip currents, causing several drownings.
- RMS estimates a return period of between 30 and 125 years for Hurricane Maria insured loss estimate range in the Caribbean.



Track of Hurricane Maria at 11am on  
September 18 (U.S. time) (source: NOAA)

## EQ Mexico

September 19, 2017

### Puebla, Central Mexico

### Magnitude 7.1

### Max. Intensity: VII – Very Strong (MMI)



### Insured losses (in USD billions)

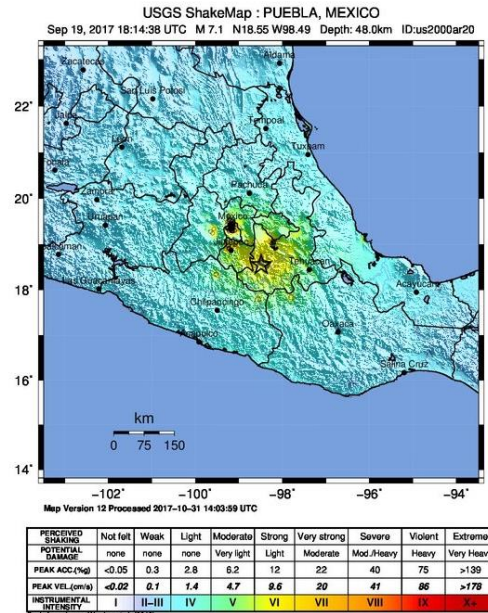
- 1.2 (RMS)
- 2.1 (AIR)
- 4.8 (ERN)

### Economic losses (in USD billions)

- 4-8 (RMS)
- 1-10 (with 38% probability, USGS)

### Fatalities: 369 (RMS)

- On September 19 at 13:14 (local time), a magnitude Mw 7.1 earthquake struck 48 km SSW of Puebla City (population ~3 million) and 120 km southeast of Mexico City (population ~20.4 million).
- The event occurred at about 50 km depth, most likely as an intraslab event within the subducting Cocos plate.
- Maximum MMI shaking intensities of VII (very strong) were recorded, with 19 million people feeling shaking of MMI VIII (strong) (USGS).
- 369 fatalities, more than half of these in Mexico City. > 6,000 injured.
- Extensive damage was reported throughout Central Mexico, with Mexico City, Morelos, Puebla, Mexico state and Guerrero being significantly affected.
- The majority of buildings in Mexico are of reinforced, confined or unreinforced masonry, with unreinforced masonry being the most vulnerable to damage (AIR).
- In Mexico City, 52 buildings collapsed and approximately 500 were damaged, including schools, hospitals and churches (AIR).
- The Federal Electricity Commission (CFE) reported that 4.84 million people lost power.
- Gas mains in parts of Mexico City and other towns ruptured during the event, sparking fires.
- The municipality of Jojutla (population ~55,000) in Morelos state also suffered significant damage, with reports of some buildings collapsing.



Intensity (MMI) map of affected area (source: USGS)

## WS Xavier

October 5, 2017

**Czech Republic,  
Germany, Poland**

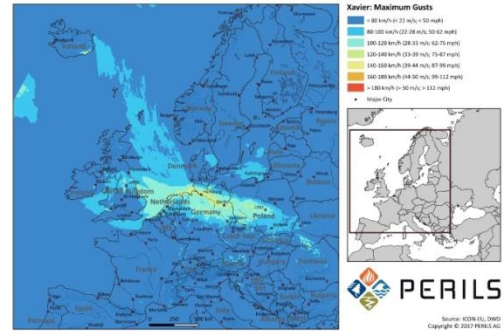


**Insured losses  
(in USD millions)**

- **342 (PERILS)**

**Fatalities: 9  
(PERILS)**

- Fast moving depression (covering 3,000 km in 24 hours), and deepened to 985 hPa while passing Northern and Eastern Germany.
- Peak gust value in Saxony-Anhalt, northern Germany of 176 km/h. Gusts in excess of 100 km/h were widespread from Hamburg to Berlin.
- Nine deaths reported, seven in Germany, two in Poland, most from falling trees.
- Berlin fire brigade declared state of emergency with total of 3,000 storm-related call-outs.
- Majority of damage was non-structural. A notable loss was a 1,000 ton crane in Wilhelmshaven.
- Notable disruption to railways in Berlin; with Xavier arriving during the evening commute, trains were quickly re-purposed as “hotel trains.”



**Low pressure system Xavier as of October 5 (source: PERILS)**

## HU Nate

October 7 to 9, 2017

**Central America,  
Cuba, Yucatan  
Peninsula, Gulf  
Coast of the U.S.**

### Category 1



### Insured losses (in USD millions)

- **<500** (RMS US, incl. loss to NFIP)
- **<1,000** (AIR)
- **500** (KCC US)
- **108.3** (PCS US)

### Fatalities:

- **2** (U.S.)
- **43** (Caribbean)
- **28** (South America)

- Hurricane Nate was the fourth hurricane to make landfall in the U.S., the first time that four hurricanes have made landfall since 2005.
- Nate was an unusually fast-moving tropical cyclone that caused widespread damages and fatalities in Central America before making landfall on the U.S. Gulf Coast.
- Nate formed as a tropical storm over the southwestern Caribbean on October 3 as it battered the Nicaragua coastline.
- Nate attained hurricane strength while moving through the Yucatan Channel and made landfall as a Category 1 storm near the mouth of the Mississippi River in Louisiana on October 8.
- Nate then crossed the marshland of the Mississippi Delta before making a second U.S. landfall near Biloxi, Mississippi.
- > 27 fatalities in Nicaragua and Costa Rica before Nate impacted the U.S.
- Storm surge of 152cm to 183 cm was recorded along the Gulf Coast.
- Several tornadoes touched down in South Carolina and Alabama.
- Rainfall from the storm was limited due to the fast forward motion of the storm. Isolated rainfall amounts of 178 mm were recorded in Dixon, Alabama.
- Minor wind and surge damage was reported for residential and commercial properties along the Gulf Coast.
- Costa Rica's government declared a national state of emergency, with > 400,000 citizens without running water.
- Nate reportedly caused significant damage to infrastructure and flooding in Nicaragua.



**Wind speed and path of Hurricane Nate as of October 6 (source: NOAA)**

## WF Northern California

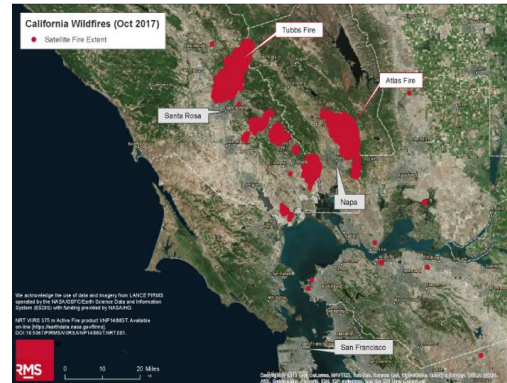
October 8 to 20, 2017

**Napa, Lake, Sonoma, Mendocino, Butte, Solano**



**Fatalities: 44**

- The event was a result of three large wildfires which burned over 245,000 acres (99,148 hectares) of land across northern California.
- The Tubbs wildfire started on the night of October 8 in Calistoga. The Nuns Wildfire started on October 11 north and east of Sonoma. The Atlas Fire started in Napa County, north of Napa.
- All of the wildfires were triggered and spread rapidly due to dry surface fuel, strong winds, high temperatures and low humidity.
- Sporadic windy conditions continued to spread the fires and caused difficulty in containment.
- 44 fatalities.
- Collectively, this event is the largest loss of life due to wildfires in the U.S. since the Cloquet Fire in 1918.
- > 8,900 structures were destroyed and > 100,000 people were evacuated.



**Fire perimeters during October (source: RMS)**

## ST South Africa

October 9 to 10, 2017

**Gauteng and KwaZulu-Natal Provinces, South Africa**

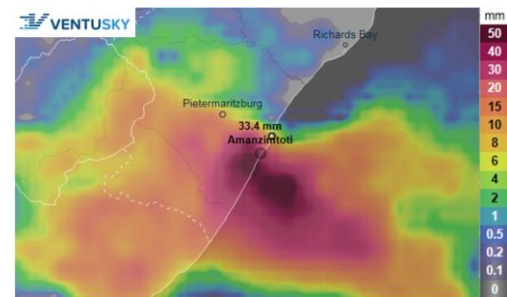


**Insured losses (in USD millions)**

- **72-109** (Willis Re at November 2017)

**Fatalities: 7**

- During October 9, a severe convective storm brought an intense hailstorm, strong winds and heavy precipitation to the Gauteng region.
- The following day, torrential rainfall in the eastern coastal province of KwaZulu-Natal caused intense flash-flooding in south Durban.
- Hailstones the sizes of golf-balls were observed in Krugersdorp, Gauteng, while in Amanzimtoti, south of Durban, winds of up to 70 km/h were recorded.
- Seven fatalities.
- West Rand and Ekurhuleni were the areas worst affected by the Gauteng storm.
- Dozens of drivers were rescued from submerged vehicles in Randburg. Major roads in south Durban were also closed temporarily, including the N2 highway.
- An explosion at a power sub-station in Boksburg caused power outages across East Rand.
- Damage from storm activity, including hailstones, resulted in claims to property and motor.
- The port of Durban was also affected, with shipping routes temporarily blocked.



**Accumulated precipitation in Durban between 08:00 and 11:00 on October 10 (source: Ventusky)**



## WF Iberian Peninsula

October 15 to 17, 2017

### Central Portugal Northwest Spain

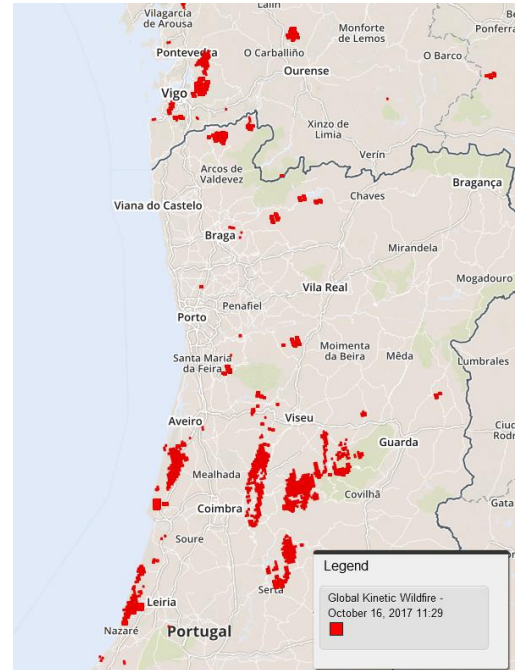


### Insured losses (in USD millions)

- **210**  
(Portuguese Association of Insurers via Algarve Daily News)

### Fatalities: 49

- A series of deadly wildfires took place across central Portugal and northwest Spain, initiating on October 15 and lasting several days.
- Around 500 wildfires erupted in the region – the highest number in a single day for more than ten years.
- The fires were caused by a combination of high temperatures, drought and strong Atlantic winds associated with the tail-end of Hurricane Ophelia.
- A state of emergency was declared in areas north of the River Tagus in the Iberian Peninsula and > 6,000 firefighters were required to battle the fires. All active fires in Portugal had been extinguished by 17th October.
- 45 fatalities in Portugal and four fatalities in the Galicia, Spain. 60 injured.
- As of the end of October, APS had received over 2,000 claims (Portuguese Association of Insurers via Algarve Daily News).
- Between January and October 2017, > 350,000 hectares (865,000 acres) of vegetation had been consumed across Portugal – four times the annual average over the past decade (European Forest Fire Information System).



**Wildfire footprint at 11:29, October 16**  
(source: Global Kinetic Wildfire via Spatial Key)

## WS Herwart

October 29, 2017

**Austria, Czech Republic, Denmark, Germany, Poland, Slovakia**



**Insured losses  
(in USD millions)**

**Total:**

- 268 (PERILS)
- 316 (XPRIMM)

**Germany:**

- 187 (PERILS)

**Austria:**

- 68 (PERILS)

**Czech Republic:**

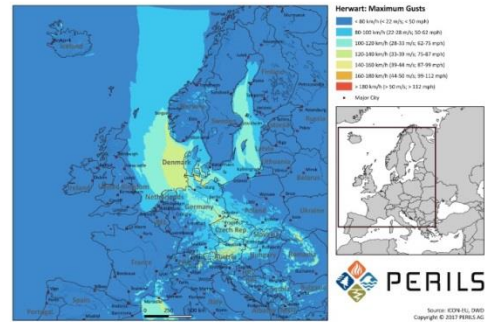
- 35 (XPRIMM)

**Hungary:**

- 1 (Magyar Biztosítók Szövetsége)

**Fatalities: 11  
(PERILS)**

- Reached minimum pressure of 974 hPa, creating high winds from interaction with system Vera which was located in southern France.
- In Germany, peak gust speed of 176 km/h was recorded in Saxony. In Austria peak gusts of 180 km/h were recorded at elevation.
- Gusts above 100 km/h were widespread in low lying regions.
- Some regions in Germany had already been affected by Xavier.
- 11 fatalities reported, including four in Czech Republic and four in Germany.
- Majority of damage was non-structural.



**Low pressure system Herwart as of October 29 (source: PERILS)**

## EQ Iran

November 12, 2017

### Iran-Iraq Border

### Magnitude 7.3

### Max. Intensity: VIII – severe (MMI)



### Insured losses (in USD millions)

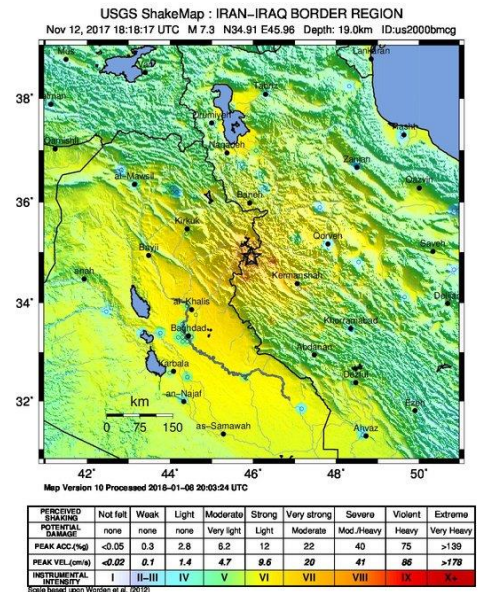
- 9 (Iran Insurance Company via Financial Tribune)

### Economic losses (in USD millions)

- 100-1,000 (with 32% probability, USGS)
- 803 (Kermanshah Governorate via IRNA)
- 119-787 (CEDIM KIT)

Fatalities: 620

- Deadliest earthquake in 2017 and deadliest in Iran for over a decade.
- On November 12 at 21:18 (local time), a magnitude Mw 7.3 earthquake occurred near the Iran-Iraq border, its epicenter located 32 km south of Halabjah, Iraq.
- The earthquake resulted from shallow oblique-thrust faulting, producing shaking of up to MMI VIII (severe) in Halabjah and the Iranian province of Kermanshah (USGS).
- 620 fatalities, > 12,000 injured (Iranian Legal Medicine Organization via IRNA).
- The town of Sarpol-e Zahab in Iran was the worst affected, with 559 reported fatalities.
- 70,000 people were left homeless after 12,000 houses were destroyed and a further 15,000 damaged. In Kermanshah province, between 50% and 100% of residential units are estimated to have been damaged or destroyed (Iranian Red Crescent).
- A total of 108 school buildings were also damaged (UNICEF).
- Structures within the region are typically vulnerable to shaking due to non-resistant adobe or concrete-frame construction types.
- The last earthquake of comparable size in northwest Iran struck in June 1990, approximately 400 km northeast of the November 12 event and caused over 40,000 fatalities.



Intensity (MMI) map of affected area (source: USGS)

## FL Greece

November 14 to 19, 2017

### Greece



### Insured losses (in USD millions)

- **32-42** (Willis Re at November 2017)

### Fatalities: 21

- A slow moving low pressure system brought heavy precipitation across Greece from November 14 to 19, causing severe localized flooding and mudslides.
- Fueled by a steep vertical temperature gradient, a low pressure system in the Mediterranean intensified into Mediane Zenon.
- Rainfall exceeding 350 mm/day resulted in flash-floods and mudslides across Symi, Greater Athens, Trikala, Ipiros and Kefalonia, as well as other areas.
- Flooding was exacerbated by the lack of rainfall in preceding months and blocked drainage infrastructure.
- 21 fatalities, 39 injured.
- Damage to infrastructure, property and vehicles.
- The worst-affected were in West Athens where 1,200 buildings were damaged.
- In Symi, the floods caused damage to roads, irrigation infrastructure and electricity lines. In Patra, Larissa and Trikala, mudslides and flooding swept away cars and caused severe property damage.
- In Katerini, 100 properties were affected as well as railway infrastructure.
- Insured loss estimates at November suggest a market impact similar to the July 2002 Athens flood event.



**Regions in Greece affected by November flooding**

## WF Southern California

December 4 to 23, 2017

**Santa Barbara County, Ventura County, San Diego County**



**Fatalities: 2**

- The event was a result of six large wildfires which burned > 307,900 acres (124,603 hectares) of land across southern California.
- The Thomas fire became the largest wildfire in modern California history and started north of Santa Paula on December 4. The Creek fire started north of Los Angeles on the Kagel Canyon Road on December 5. The Rye fire started in Santa Clarita on December 5. The Lilac fire started in San Diego County on December 7.
- All of the wildfires were triggered and spread rapidly due to large amounts of dry vegetation and powerful, long-lasting Santa Ana winds.
- The fires forced > 230,000 residents to evacuate their homes.
- The fires destroyed > 1,329 structures and damaged > 404 additional structures.
- The California Department of Forestry and Fire Prevention estimate the cost of fighting the Thomas fire alone at more than USD 150 million.



**Fire outlook on December 4 (source: NOAA)**



# Other natural catastrophe events by peril and location

Events highlighted in the following tables represent those with detailed information presented in the first part of the report.

## Windstorm

Name	Date	Location	Losses (USD millions)	Fatalities
<b>Egon</b>	<b>Jan 12 to 13</b>	<b>France, Germany</b>	<b>Insured: 289 (PERILS)</b>	<b>3</b>
Kurt-Leiv-Marcel	Feb 3	France, Italy, Spain	Insured: < 210 (PERILS)	2
<b>Thomas (Doris)</b>	<b>Feb 23 to 24</b>	<b>Belgium, Germany, Ireland, Netherlands, United Kingdom</b>	<b>Insured: 262 (PERILS)</b>	<b>5</b>
Udo-Volkmar (Ewan)	Feb 26	France, Switzerland	Insured: < 210 (PERILS)	Unknown
<b>Zeus</b>	<b>Mar 6 to 7</b>	<b>France</b>	<b>Insured: 299 (PERILS)</b>	<b>Unknown</b>
Sebastian (Aileen)	Sep 12	Germany, Netherlands, United Kingdom	Insured: < 210 (PERILS)	3
<b>Xavier</b>	<b>Oct 4</b>	<b>Germany, Poland</b>	<b>Insured: &gt; 105 (Willis Re), 342 (PERILS)</b>	<b>9</b>
Ophelia	Oct 16	Ireland, United Kingdom	Insured: 63 (PERILS)	3
<b>Herwart</b>	<b>Oct 29</b>	<b>Austria, Czech Republic, Germany, Hungary</b>	<b>Insured: 268 (PERILS), 316 (XPRIMM)</b>	<b>10</b>
Reinhard	Nov 23	Norway	Economic: Not significant	Unknown
Walter (Caroline)	Dec 7	Norway, United Kingdom	Insured: < 210 (PERILS)	Unknown
Xanthos-Yves	Dec 10	Austria, Belgium, Czech Republic, France, Germany	Insured: < 210 (PERILS)	Unknown
Horst (Dylan)	Dec 31	Ireland, United Kingdom	Economic: Not significant	Unknown

## Blizzard

Name	Date	Location	Losses (USD millions)	Fatalities
U.S.A Winter Storm Iras	Jan 6 to 9	Western U.S.	Insured: 274-280 (PCS)	Unknown
Frost Western Europe	Apr 20 to 21	Austria, France, Germany, Italy, Switzerland	Economic: > 1,000 (FGWB)	0
New Zealand Snow	Jul 12 to Jul 14	New Zealand	Insured: > 7 (ICNZ)	0

## Severe Thunderstorm (Tornado/Hail/Straight Wind)

Name	Date	Location	Losses (USD millions)	Fatalities
U.S. Severe Weather	Jan 1 to 3	Southern and Southeast U.S.	Insured: 160 (PCS)	0
New Zealand Severe Weather	Jan 18 to Jan 23	New Zealand	Insured: > 5.9 (ICNZ) Economic: > 6.6 (ICNZ)	0
<b>U.S. Severe Weather</b>	<b>Jan 18 to 23</b>	<b>Southern and Southeast U.S.</b>	<b>Insured: 846-853 (PCS) Economic: 1,100 (NOAA)</b>	<b>0</b>
Western Europe Severe Weather	Jan 20 to 24	France, Italy, Spain	Economic: Not significant	3
<b>Sydney Hailstorm</b>	<b>Feb 17 to 19</b>	<b>Australia</b>	<b>Insured: &gt; 368 (ICA)</b>	<b>1</b>
U.S. Severe Weather	Feb 19 to 20	Texas U.S.	Insured: 154 (PCS)	Unknown
U.S. Severe Storm	Feb 25	Eastern U.S.	Insured: 142 (PCS)	0
<b>U.S. Severe Weather</b>	<b>Feb 28 to Mar 2</b>	<b>Midwest U.S.</b>	<b>Insured: 901-1,400 (PCS) Economic: 1,800 (NOAA)</b>	<b>6</b>
<b>U.S. Midwest Tornado Outbreak</b>	<b>Mar 6 to 9</b>	<b>Midwest U.S.</b>	<b>Insured: 1,100-1,600 (PCS) Economic: 2,200 (NOAA)</b>	<b>2</b>
U.S. Severe Weather	Mar 21 to 22	Southeast U.S.	Insured: 482 - 693 (PCS)	1
U.S. Severe Weather	Mar 26 to 28	Southern U.S.	Insured: 1,300 - 2,000 (PCS) Economic: 2,700 (NOAA)	0
U.S. Severe Weather	Mar 28 to 31	Southern U.S.	Insured: 237 (PCS)	Unknown
U.S. Severe Weather	Apr 2 to 3	Southern U.S.	Insured: 230 (PCS)	Unknown
U.S. Severe Weather	Apr 4 to 6	South and Southeast U.S.A	Insured: 401-658 (PCS) Economic: Significant	Unknown
U.S. Severe Weather	Apr 10 to 11	Midwest U.S.	Insured: 218 (PCS)	Unknown
U.S. Severe Weather	Apr 21 to 25	Southern U.S.	Insured: 466-670 (PCS) Economic: Significant	Unknown
Texas Severe Storms	Apr 26	Texas, U.S.	Insured: 74 (PCS) Economic: Significant	0
U.S. Severe Weather	May 3 to 5	Southern U.S.	Insured: 115 (PCS)	0
<b>U.S. Severe Weather</b>	<b>May 8 to 11</b>	<b>Midwest U.S.</b>	<b>Insured: 1,755-2,507 (PCS) Economic: 3,400 (NOAA)</b>	<b>0</b>
U.S. Severe Weather	May 15 to 18	Midwest U.S.	Insured: 667-675 (PCS)	Unknown
U.S. Severe Weather	May 27 to 28	Southern U.S.	Insured: 284-440 (PCS)	0
Russia Severe Weather	May 29	Russia	Insured: 1 (IPJSC Ingosstrakh)	14
Texas Severe Weather	Jun 2 to 4	Texas, U.S.	Insured: 120 (PCS)	0
<b>U.S. Severe Storm</b>	<b>Jun 11</b>	<b>Minnesota and Wisconsin, U.S.</b>	<b>Insured: 980-1,549 (PCS) Economic: 2,400 (NOAA)</b>	<b>0</b>
U.S. Severe Weather	Jun 12 to 14	Texas and Wyoming, U.S.	Insured: 606-742 (PCS) Economic: 1,500 (NOAA)	0
U.S. Severe Weather	Jun 16 to 19	Midwest U.S.	Insured: 390-399 (PCS)	Unknown
Hungary Hailstorm	Jun 21	Hungary	Economic: Not significant	Unknown
<b>ST Series (including Paul and Rasmund)</b>	<b>Jun 22</b>	<b>Germany</b>	<b>Insured: 315 (WRe - Property)</b>	<b>Unknown</b>
Central & Southern Europe Severe Weather	Jun 22 to 25	Central & Southern Europe	Economic: Significant	4
<b>U.S. Severe Weather</b>	<b>Jun 27 to 29</b>	<b>Midwest U.S.</b>	<b>Insured: 768-1,114 (PCS)</b>	<b>0</b>

Economic: 1,400 (NOAA)				
U.S. Severe Weather	Jul 11 to 12	Illinois and Minnesota, U.S.	Insured: 110 (PCS)	0
U.S. Severe Weather	Jul 21 to 23	Midwest U.S.	Insured: 316-459 (PCS)	0
Central & Southern Europe Severe Weather	Jul 21 to 27	Central & Southern Europe	Economic: Not significant	0
<b>Turkey</b>	<b>Jul 27</b>	<b>Istanbul, Turkey</b>	<b>Insured: 253 (PCS), &lt; 142 (PERILS)</b>	<b>0</b>
U.S. Severe Weather	Aug 5 to 8	Southern Plains U.S.	Insured: 168 (PCS)	0
Central Europe Severe Weather	Aug 10 to 11	Czech Republic, Poland, Slovakia	Economic: 1,000 (Poland, LAS)	6
Central Europe Severe Weather (Kolle)	Aug 18	Central Europe	Economic: Not significant	5
South Africa Convective Storm	Sep 16	Durban, South Africa	Economic: Not significant	0
Romania Severe Weather	Sep 17	Romania	Economic: Not significant	8
Bundaberg Storms/Tornado	Oct 2	Australia	Insured: > 5 (ICA)	0
<b>Thunderstorm South Africa</b>	<b>Oct 9 to 10</b>	<b>Gauteng &amp; KwaZulu Natal Provinces, South Africa</b>	<b>Insured: 70-110 (Willis Re)</b>	<b>7</b>
U.S. Severe Weather	Oct 14 to 15	Midwest U.S.	Insured: 116 (PCS)	0
U.S. Severe Weather	Oct 23 to 24	North and South Carolina, U.S.	Insured: 89 (PCS)	Unknown
U.S. Severe Weather	Oct 29 to 30	Northeast U.S.	Insured: 499 (PCS)	0
U.S. Severe Weather	Nov 5 to 6	Missouri and Ohio, U.S.	Insured: 199 (PCS)	0
Bundaberg Hailstorms	Nov 7	Australia	Insured: 10 (ICA)	0
Southern Europe Severe Weather	Nov 11 to 19	Greece, Italy, Turkey	Economic: Not significant	21
South Africa Convective Storm	Dec 30	Gauteng & KwaZulu Natal Provinces, South Africa	Economic: Not significant	0

## Tropical Cyclone — Atlantic Ocean

Name	Date	Location	Category*	Losses (USD millions)	Fatalities
Tropical Storm Bret	Jun 19 to 20	SE Caribbean, Venezuela, Trinidad and Tobago	Tropical Storm	Economic: Low (GDAS)	0
Hurricane Franklin	Aug 7 to 10	SE Caribbean, Mexico	4	Economic: Not Significant	0
<b>Harvey</b>	<b>Aug 25 to Sep 1</b>	<b>South and Southeast U.S.</b>	<b>4</b>	<b>Insured: 25,000-35,000 (RMS) Economic: 108,000 (Moody's)</b>	<b>89</b>
<b>Hurricane Irma</b>	<b>Aug 30 to Sep 11</b>	<b>Southeast U.S., Caribbean</b>	<b>5</b>	<b>Insured: 10,000-20,000 (Caribbean, RMS), 25,000-55,000 (USA, RMS), 58,000-83,000 (Moody's) Economic: 27,000-48,000 (Caribbean, AIR)</b>	<b>134</b>
Hurricane Katia	Sep 5 to 9	Gulf of Mexico, Mexico	2	Economic: Not Significant (NOAA)	2
Hurricane Jose	Sep 5 to 22	Caribbean, Leeward Islands and Bahamas	4	Economic: Low (GDAS)	1
<b>Hurricane Maria</b>	<b>Sep 16 to 30</b>	<b>North America, Caribbean - Puerto Rico, Windward Islands, Dominica, Guadeloupe, US Virgin Islands, Dominican Republic</b>	<b>5</b>	<b>Insured: 15,000-30,000 (Caribbean, RMS) 25,000-43,000 (USA, AIR), 27,000-48,000 (Caribbean, AIR) Economic: 30,000-60,000 (Caribbean, RMS), 45,000-95,000 (Moody's)</b>	<b>65 direct, 1,085 indirect</b>
<b>Hurricane Nate</b>	<b>Oct 4 to 9</b>	<b>Nicaragua, Honduras, Panama, Costa Rica, Southeast U.S.</b>	<b>1</b>	<b>Insured: &lt; 500 (RMS)</b>	<b>78</b>

\* Saffir-Simpson Hurricane scale

## Tropical Cyclone — Eastern Pacific

Name	Date	Location	Category*	Losses (USD millions)	Fatalities
Tropical Storm Beatriz	May 31 to Jun 2	Oaxaca, Southern Mexico	Tropical Storm	Economic: Low (NOAA)	6
Tropical Storm Calvin	Jun 11 to 13	Paja Blanca, Southern Mexico	Tropical Storm	Economic: Not Significant (NOAA)	0
Tropical Storm Lidia	Aug 31 to Sep 3	Puerto Chale and Baja California Sur, Mexico	Tropical Storm	Economic: Low (wunderground)	5 direct , 2 indirect
Hurricane Max	Sep 13 to 15	Guerrero, Mexico	1	Economic: Low (wunderground)	2
Tropical Storm Selma	Oct 27 to 28	San Salvador, El Salvador	Tropical Storm	Economic: None (wunderground), although indirectly Selma's remnants resulted in the Honduras and Nicaragua flooding events.	0

\* Saffir-Simpson Hurricane scale



## Tropical Cyclone — North-Western Pacific

Name	Date	Location	Category*	Losses (USD millions)	Fatalities
Auring	Jan 7 to 16	Philippines	Tropical Storm	Economic: Not significant	3
Crising	Apr 13 to 20	Philippines	Tropical Depression	Economic > 1.7 (CEBU)	10
Muifa / Dante	Apr 25 to 29	Philippines, South Korea	Tropical Storm	Economic: Not significant	Unknown
Merbok	Jun 10 to 13	China	Tropical Storm	Economic: > 37.4 (Chinese Ministry of Civil Affairs), 38 (Guangdong Province's civil affairs authorities)	0
Nanmadol	Jul 1 to 4	Japan	Tropical Storm	Economic: Not significant	> 40
Talas	Jul 14 to 17	China, Vietnam	Tropical Storm	Economic: > 43 (Vietnam Express)	> 14
Noru	Jul 19 to Aug 8	Japan	5	Economic: Not significant	2
Sonca	Jul 21 to 29	Vietnam, Thailand	Tropical Storm	Economic: > 279 (Thai General Insurance Association)	> 23
Roke	Jul 21 to 23	Vietnam, China, Cambodia, Thailand	Tropical Storm	Economic: Not significant	0
Nesat (Gorio)	Jul 25 to 30	Philippines, China, Taiwan	1	Economic: Philippines > 2 (NDRRMC), Taiwan > 8.6 (AXCO)	3
Haitang	Jul 27 to Aug 2	China, Taiwan	Tropical Storm	Economic: Not significant	0
<b>Hato</b>	<b>Aug 19 to 24</b>	<b>China</b>	<b>2</b>	<b>Insured: 129.3 - 223.8 (AIR) Economic: 1,439 (Chinese Ministry of Civil Affairs)</b>	<b>22</b>
Sanvu	Aug 27 to Sep 3	Japan	1	Economic: Not significant	0
Pakhar	Aug 24 to 27	China	1	Economic: > 53.2 (Hong Kong Observatory)	12
Mawar	Aug 30 to Sep 4	China	Tropical Storm	Economic: Not significant	Unknown
Guchol (Kiko)	Sep 3 to 7	China, Philippines	Tropical Storm	Economic: Not significant	0
Talim (Lannie)	Sep 8 to 17	Japan	Tropical Storm	Economic: Not significant	Unknown
Doksuri	Sep 10 to 16	Philippines	3	Economic: > 5.3 (NDRRMC)	> 6
Khanun (Odette)	Oct 11 to 16	China, Philippines	Tropical Storm	Economic: China > 80.6 (Chinese Ministry of Civil Affairs), Philippines > 0.089 (NDRRMC)	Unknown
Lan	Oct 14 to 23	Japan	2	Economic: Not significant	8
Saola	Oct 19 to 29	Japan	1	Economic: Not significant	Unknown
Damrey (Ramil)	Oct 31 to Nov 5	Philippines, Vietnam, Cambodia	2	Economic: Not significant	Unknown
Haiui (Salome)	Nov 9 to 13	Philippines	Tropical Storm	Economic: Not significant	Unknown
Kirogi (Tino)	Nov 16 to 20	Philippines, Borneo, Vietnam, Cambodia	Tropical Storm	Economic: Not significant	Unknown
Kai-Tak	Dec 13 to 22	Philippines	Tropical Storm	Economic: Not significant	Unknown
Tembin (Vinta)	Dec 20 to 26	Philippines	1	Economic: Not significant	> 30

## Tropical Cyclone — Southern Pacific and Oceania

Name	Date	Location	Category*	Losses (USD millions)	Fatalities
Debbie	Mar 28 to Apr 3	Queensland, Australia	4	Economic: 2,510 (Swiss Re), 2,700 (Munich Re), 1,405 (PERILS), 1,366 (ICA) Insured: 1,320 (Swiss Re), 1,400 (Munich Re), 1,194 (PERILS), 1,161 (ICA)	12
Cook	Apr 13 to 16	New Zealand	2	Insured: > 11.9 (ICNZ)	Unknown
Frances	Apr 27 to May 1	Australia	Tropical Storm	Economic: Not significant	Unknown
Donna	May 2 to 10	New Caledonia	4	Economic: Not significant	Unknown
Ella	May 2 to 14	Fiji	Tropical Storm	Economic: Not significant	0

\* Saffir-Simpson Hurricane scale

## Tropical Cyclone — Indian Ocean

Name	Date	Location	Category*	Losses (USD millions)	Fatalities
Dineo	Feb 15	Mozambique	1	Economic: 17 (Zitamar)	7
Enawo	Mar 7 to 9	Madagascar	4	Economic: 400 (World Bank)	81
Maarutha	Apr 15 to 17	Myanmar	Tropical Storm	Economic: 0.023 (Global New Light of Myanmar)	4
Mora	May 28 to 31	Bangladesh, India	1	Economic: 6 (Civil Aviation and Tourism Sector)	>180
Ockhi	Nov 29 to Dec 6	Sri Lanka, India	3	Economic: Not significant	27

\* Saffir-Simpson Hurricane scale

## Flood

Name	Date	Location	Losses (USD millions)	Fatalities
Thailand Flood	Dec 31 2016 to Jan 21	Thailand	Economic: Significant	> 98
<b>Peru Floods</b>	<b>Jan to Apr</b>	<b>Peru</b>	<b>Insured: 380 (Munich Re) Economic: 3100 (Munich Re)</b>	<b>114</b>
Southern Africa	Oct 2016 to Jan 1	Mozambique, Zimbabwe	Economic: Not significant	44
Philippines Flood	Jan 16 to Feb 7	Philippines	Economic: Not significant	Unknown
Southern U.S.	Feb 7	Southern U.S.	Insured: 121 (PCS)	Unknown
California	Feb 8 to 22	U.S.	Insured: 284 (PCS) Economic: 1,500 (NOAA)	Unknown
Dunedin Flooding	Feb 13	New Zealand	Insured: > 1.1 (ICNZ)	Unknown
Chile Floods	Feb 24 to 26	Cortés, Yoro, Atlántida, Islas de La Bahía and Colón, Chile	Economic: Not Significant	> 3
Tasman Tempest	Mar 7 to Mar 12	Auckland, New Zealand	Insured: > 89 (ICNZ)	Unknown
Southern Africa	Mar 21 to 22	Angola, South Africa	Economic: Not significant	11
Northwest U.S.	Mar 21 to 24	ID, OR, WA U.S.	Insured: Unknown	Unknown
Colombia Floods	Apr 1 to 2	Putumayo, Colombia	Economic: Low	329
Argentina Floods	Apr 7 to 8	Patagonian Province	Economic: Low	2
California and Oregon Flooding	Apr 7 to 8	U.S.	Insured: 62 (PCS)	0
Iran	Apr 14 to 15	Northwest Iran	Economic: Significant	> 40
Caribbean Floods	Apr 20 to 23	Jamaica, Haiti, Dom Rep	Economic: Not Significant	4
<b>Southern U.S. Flooding</b>	<b>Apr 28 to May 1</b>	<b>Southern, Midwest, Eastern U.S.</b>	<b>Insured: 540-606 (PCS) Economic: Significant</b>	<b>9</b>
East Africa	May 8 to 15	Kenya, Tanzania	Economic: Not significant	26
<b>Sri Lanka Flood</b>	<b>May 25 to May 28</b>	<b>Sri Lanka</b>	<b>Economic: 473.4 (Post-Disaster Needs Assessment)</b>	<b>&gt; 219</b>
Brazils Floods	May 26 to 29	Brazil	Economic: Low (ReliefWeb)	> 7
Honduras/Guatemala Floods	Jun 10 to 11	Honduras, Guatemala	Economic: Not Significant	2
West Africa	Jun 10 to 16	Niger, Ivory Coast	Economic: Not significant	38
Deep Depression BOB 03	Jun 11 to Jun 13	Bangladesh, India	Economic: Significant	152
Chile Floods	Jun 16 to 17	Chile	Economic: Low	4
Asia Summer Monsoon	Jun 26 to Jun 30	China, India, Bangladesh, and Pakistan	Economic: 3.7 (Chinese Ministry of Civil Affairs)	132
Thailand Floods	Jul 1 to Jul 31	Thailand	Economic: > 2.7 (Sakon Nakhon Chamber of Commerce)	15
Southern Japan Flooding	Jul 6	Japan	Economic: Not significant	7
Switzerland	Jul 8	Switzerland	Economic: Not significant	0
Nigeria	Jul 8 to 9	Nigeria	Economic: Not significant	10
Niger	Jul 10	Niger	Economic: Not significant	23
Odisha Floods	Jul 15 to Jul 18	India	Economic: >32.8 (Odisha Government)	Unknown

<b>Turkey</b>	<b>Jul 18</b>	<b>Northwest Turkey</b>	<b>Insured: 45 (PCS), &lt; 142 ( PERILS)</b>	<b>0</b>
New Zealand Flood	Jul 20 to Jul 22	New Zealand	Insured: > 14.4 (ICNZ)	Unknown
Northern Japan Flooding	Jul 21 to Jul 23	Japan	Economic: Not significant	0
West Bengal Floods	Jul 26 to Aug 10	India	Economic: > 81.3 (The Mamata Banerjee Government)	> 50
Nepal Floods	Aug 1 to Aug 31	Nepal	Insured: > 19.5 (Nepal Insurance Board) Economic: > 91.8 (Nepal Insurance Board)	143
Northern Vietnam Flooding	Aug 2 to Aug 9	Vietnam	Economic: Not significant	> 26
Western & Central Europe	Aug 5 to 6	Austria, Italy, Balkans	Economic: Not significant	7
Iran	Aug 10 to 11	Northern Iran	Economic: > 35 (Iranian Government via IRNA)	51
Yemen	Aug 30	Southern Yemen	Economic: Not significant	18
China Flood	Sep 8 to Sep 11	China	Economic: Not significant	Unknown
Italy	Sep 9 to 10	Livorno, Italy	Economic: Significant	8
Croatia	Sep 11	Zadar, Croatia	Economic: Not significant	0
China Flood	Sep 18 to Sep 19	China	Economic: Not significant	Unknown
China Flood	Sep 24 to Sep 30	China	Economic: Not significant	Unknown
Uganda	Sep 26	Western Uganda	Economic: Not significant	> 15
Norway	Sep 30 to Oct 2	Vest-Agder, Aust-Agder, Norway	Economic: 58 (Finance Norway via NRK)	0
China Flood	Oct 1 to Oct 12	China	Economic: Not significant	> 10
Vietnam Flood	Oct 10 to Oct 15	Vietnam	Economic: Not significant	> 72
Thailand Flood	Oct 10 to Oct 25	Thailand	Economic: Not significant	10
Nicaragua Floods	Oct 25 to 27	Nicaragua	Economic: Not Significant	10
Honduras Floods	Oct 27 to 30	Honduras	Economic: Not Significant	7
Haiti Floods	Nov 14 to 18	Sud, Nord-Ouest, and Nippes, Haiti	Economic: Not Significant	5
<b>Greece</b>	<b>Nov 14 to 19</b>	<b>Greece</b>	<b>Insured: 32-42 (Willis Re)</b>	<b>21</b>
Albania	Nov 30	Albania	Economic: Not significant	Unknown

## Earthquake

Name	Local Time	Location	Magnitude (Mw)	Losses (USD millions)	Fatalities
Jan 18	11:14	Central Italy	5.7	Insured: < 210 (PERILS) Economic: 100-1,000 (with 35%)	> 29 indirect

				probability, USGS)	
Jan 18	19:42	Indonesia	5.6	Economic: Not significant	Unknown
Feb 7	03:03	Pakistan	6.3	Economic: Not Significant	0
Feb 8	03:03	Pasni, Pakistan	6.3	Economic: Not significant	Unknown
Feb 10	22:04	Philippines	6.5	Economic: 1-100 (with 74% probability, USGS)	8
Mar 2	14:07	Samsat, Turkey	5.6	Economic: Not significant	0
Mar 5	08:08	Philippines	5.7	Economic: Not Significant	1
Apr 3	05:09	Stilfontein, South Africa	5.2	Economic: 1-10 (with 35% probability, USGS)	0
Apr 3	19:40	Mojabana, Botswana	6.5	Economic: Not significant	Unknown
Apr 5	09:09	Torbat-e Jam, Iran	6.1	Economic: Not significant	2
Apr 8	15:09	Philippines	5.9	Economic: Not Significant	0
Apr 11	05:21	Philippines	5.8	Economic: Not Significant	0
Apr 24	21:38	Valparaiso, Chile	6.9	Economic: 1-10 (with 55% probability, USGS)	6
Apr 28	04:23	Philippines	6.9	Economic: Not Significant	0
May 13	21:01	Bojnurd, Iran	5.6	Economic: Not significant	3
May 15	21:22	Papua New Guinea	6.2	Economic: Not Significant	0
May 29	22:35	Indonesia	6.8	Economic: Not Significant	0
Jun 12	15:28	Lesbos, Greece	6.3	Insured: 1.1 - 5.3 (Willis Re) Economic: 10 - 100 (with 33% probability, USGS)	1
Jun 14	07:2	San Pablo, Guatemala	6.9	Economic: 1-10 (with 34% probability, USGS)	5
Jun 22	12:31	San Jose, Guatemala	6.8	Economic: 10-100 (with 35% probability, USGS)	0
Jul 6	16:03	Philippines	6.5	Economic: 10 -100 (with 38% probability, USGS)	2
Jul 10	9:41	Philippines	5.9	Economic: Not Significant	0
Jul 21	01:31	Kos, Greece, Bodrum, Turkey	6.6	Insured: 4.2-8.4 (Willis Re) Economic: 1-10 (with 34% probability, USGS)	2
Aug 8	10:00	China	6.5	Economic: 10-100 (with 34% probability, USGS)	25
Aug 11	13:28	Philippines	6.2	Economic: Not Significant	0
Aug 13	10:08	Indonesia	6.4	Economic: Not Significant	0
Aug 23	16:43	Kuysinjaq, Iraq	5.1	Economic: Not significant	Unknown
Aug 31	01:06	Indonesia	6.3	Economic: Not Significant	0
Sep 7	23:49	Offshore Chiapas, Mexico	8.1	Insured: 792-1130 (AIR) Economic: > 2000 (Insurance Journal)	96
Sep 19	13:15	Puebla City, Central Mexico	7.1	Insured: 1200 (RMS), 2100 (AIR), 4800 (ERN) Economic: 4000-8000 (RMS)	369
Sep 23	12:53	San Jeronimo Ixtepec, Mexico	6.1	Economic: 10-100 (with 38% probability USGS)	Unknown
Nov 12	21:18	Halabjah, Iraq,	7.3	Insured: 9 (Iran Insurance Company	620




















Kermanshah Province, Iran				via Financial Tribune) Economic: 100-1,000 (with 32% probability, USGS), 800 (Kermanshah Governorate via IRNA), 119 - 787 (CEDIM KIT)	
Nov 13	02:28	Parrita, Costa Rica	6.5	Economic: 10-100 (with 35% probability, USGS)	Unknown
Nov 15	14:29	South Korea	5.5	Economic: Not Significant	0
Nov 17	06:34	China	6.4	Economic: Not Significant	0
Dec 1	05:33	Kerman, Iran	6.1	Economic: Not significant	Unknown
Dec 11	17:10	Halabjah, Iraq	5.4	Economic: Not significant	Unknown
Dec 15	23:47	Indonesia	6.5	Economic: Not Significant	4

## Wildfire

Name	Date	Location	Acres Burnt	Losses (USD millions)	Fatalities
Chile Wildfires	Jan 1 to 2	Central Maule Region, Chile	714,000	Economic: 870 (Reinsurance News)	11
Port Hills Wildfires	Feb 01	New Zealand	Unknown	Insured: > 12.2 (AXCO), > 12.6 (ICNZ)	1
NSW Bushfires	Feb 12	Australia	Unknown	Insured: > 24 (ICA)	0
<b>Southern Plains Wildfire</b>	<b>Mar 5 to 7</b>	<b>KS, OK, TX, CO, FL U.S.</b>	<b>&gt; 1,000,000</b>	<b>Economic: Significant</b>	<b>7</b>
South Africa	Jun 6	Western Cape, South Africa	Unknown	Insured: 146-182 (Willis Re)	10
<b>Portugal Wildfires</b>	<b>Jun 17 to 19</b>	<b>Central Portugal</b>	<b>111,120</b>	<b>Economic: 523 (Portuguese Government via ECO News)</b>	<b>&gt; 64</b>
European Wildfires	Jul 17	France, Italy, Portugal, Balkans	Unknown	Economic: Not significant	0
<b>Northern California Wildfires</b>	<b>Oct 8 to 20</b>	<b>Northern California, U.S.</b>	<b>&gt; 245,000</b>	<b>Economic: 6,000-8,000 (RMS)</b>	<b>44</b>
<b>Portugal Wildfires</b>	<b>Oct 15 to 17</b>	<b>Central Portugal, northwest Spain</b>	<b>133,437</b>	<b>Insured: &gt; 210 (Portuguese Association of Insurers via Algarve Daily News)</b>	<b>49</b>
<b>Southern California Wildfires</b>	<b>Dec 4 to 23</b>	<b>Southern California, U.S.</b>	<b>307,900</b>	<b>Economic: &gt; 3,000 (Calfire)</b>	<b>2</b>

## Abbreviations

### Symbols

	BL	Blizzard		HU	Hurricane		ST	Severe Thunderstorm
	DR	Drought		LS	Landslide		TS	Tsunami
	EQ	Earthquake		ME	Meteoroid		VE	Volcanic Eruption
	EX	Explosion		StS	Storm Surge		WF	Wildfire
	FL	Flood		TC	Tropical Cyclone		WS	Windstorm
	HL	Hail		TO	Tornado			

### Sources

9news (9news.com.au), ABC Net (abc.net.au), ACAPS (acaps.org), AIR (AIR Worldwide: air-worldwide.com), Algarve Daily News (algarvedailynews.com), Asia Insurance Review (asiainsurancereview.com), BoM (Australian Government Bureau of Meteorology: bom.gov.au), Cal Fire (California Department of Forestry and Fire Protection: www.fire.ca.gov), CDEMA (Caribbean Disaster Emergency Management Agency: cdema.org/), CEBU (Cebu Provincial Disaster Risk Reduction and Management Office : cebu.gov.ph), CEDIM KIT (Center for Disaster Management and Risk Reduction Technology Karlsruhe Institute of Technology: www.cedim.de), CFE (Federal Electricity Commission: cfe.gob.mx), CN (Chinese Ministry of Civil Affairs: english.gov.cn), CNN (edition.cnn.com), Coldiretti (coldiretti.it), CoreLogic (corelogic.com), Earth observatory (by NASA: earthobservatory.nasa.gov), ECO News (econews.pt), ERN (ern.com.mx), European Forest Fire Information System (effis.jrc.ec.europa.eu), FGWB (Federation of Great Wines of Bordeaux), Finance Norway (finansnorge.no), Financial Times (ft.com), Financial Tribune (financialtribune.com), FloodList (floodlist.com), Fresh Plaza (freshplaza.com), GDACS (Global Disaster Alert and Coordination System: org), GEM (Global Earthquake Model: globalearthquakemodel.org), GeoMAC (Geospatial Multi-Agency Coordination by USGS: geomac.gov), Hong Kong Observatory (weather.gov.hk), IDMC (International Displacement Monitoring Centre: internal-displacement.org), IFRC (Peruvian Red Cross: ifrc.org), INDECI (Peru Institution of national Civil Defense: gdacs indeci.gob.pe), Insurance Association of Turkey (tsb.org.tr), ICA (Insurance Council Australia: insurancecouncil.com.au), ICNZ (Insurance Council of New Zealand: icnz.org.nz), Insurance Journal (insurancejournal.com), IPJSC Ingosstrakh, (2016.ingos.ru/en/), Iran Insurance Company (iraninsurance.ir), Iran Red Crescent (en.rcs.ir), Iranian Legal Medicine Organisation (lmo.ir), IRNA (Islamic Republic News Agency: irna.ir), JCU (James Cook University Australia: jcu.edu.au), Kermanshah Governorate, MABISZ (Association of Hungarian Insurance Companies: mabisz.hu), MSK (Meyerthole Siems Kohlruess: aktuare.de/index.php/de/), Munich Re (munichre.com), NASA (National Aeronautics and Space Administration, U.S.: nasa.gov), National Geographic (news.nationalgeographic.com), Natural Disasters Rehabilitation Directorate (UNISDR Greece : unisdr.org/Europe), News (news.com.au), NOAA (National Oceanic and Atmospheric Administration, U.S.: noaa.gov), North American Forest Fire System (fires.globalincidentmap.com), NWS (NOAA National Weather Service: weather.gov), NYTimes (New York Times: nytimes.com), ODPM (Trinidad and Tobago - Office of Disaster Preparedness and Management: odpm.gov.tt), ONEMI (Chilean Government Office of National Emergency: onemi.cl), PCS (Property Claim Services: verisk.com/property-claim-services), Portuguese Association of Insurers (apseguradores.pt), Portuguese Government, PressReader (The Sunday times (Sri Lanka: pressreader.com)), Reinsurance News (reinsurancene.ws), Relief Web (reliefweb.int), Reuters (reuters.com), RMS (Risk Management Solutions: rms.com), RMS Owl Application, SENAMHI (National Meteorology Office of Peru: senamhi.gob.pe ), SPC (Storm Prediction Center, NOAA's National Weather Service: spc.noaa.gov), Swiss Re (swissre.com), Temblor (temblor.net), The Australian (myaccount.news.com.au), The Courier Mail (couriermail.com.au), The Guardian (the guardian.com), The Sunday Morning Herald (smh.com.au), Thomson Reuters Foundation News (news.trust.org), United Nations (Sri Lanka: lk.one.un.org), UPI (United Press International: upi.com), USGS (United States Geological Survey: usgs.gov), Ventusky (ventusky.com), Vox (vox.com), Weather Underground (wunderground.com), Wetter3 (wetter3.de), Willis Re SpatialKey Application, Willis Re, World Bank (worldbank.org), XPRIMM (1asig.ro), Zitamar (zitamar.com)

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